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ABSTRACT

This group of readings describes the university examination system in India, and suggests improvements which can be implemented within the current framework of the system. The papers are grouped into six sections: (1) descriptions of the evolution of the undergraduate examinations in India and their present status; (2) discussions of the confidential operations required to be executed in the examination offices along with spot evaluation and revaluation of answer scripts; (3) descriptions of examination aids like question banks and computers; (4) descriptions of statistical innovations--one that has been tried out by Gauhati University and others which are possible in mass-conducted examinations; (5) discussions of the social and curricular aspects like abolishing pass and fail in university examinations, introduction of the semester system, and malpractices in examinations; and (6) an Indian bibliography of university examinations in the post-independence period.
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THE MANAGEMENT OF EXAMINATIONS

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AMRIK SINGH
H S SINGHA

Management of Examinations is a comparatively neglected field. With the third largest educational system in the world, our universities and school boards have to handle millions of students. Sometimes the number of students examined at one examination is as large as half a million. How to cope with such large numbers demands management abilities of an exceptionally high order and a set of procedures which do not crack down under the strain of numbers. Both these pre-conditions are generally lacking in our public examinations. Some of the managerial practices in vogue in most places are so defective and outmoded that they require to be either scrapped or modified.

These are some of the problems dealt with in this pioneering book to which have contributed more than a dozen experienced and knowledgeable people. Amongst the topics dealt with are the use of mechanical aids and computers, handling of scripts and their valuation, scaling procedures, use of unfair means, grades versus marks, the semester system and a number of other questions which confront everyone connected with the management of examinations.

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PREFACE

It may be a truism to say that university examinations are in a quandary. At least, never were they so much in focus as at present when the very relevance of education system, of which they constitute a culmination and a tangible manifestation, is being called in question. The problem is, indeed, complicated and perhaps many things need to be done. A beginning can possibly be made not just by recognizing that the problem exists but by stimulating ideas about various issues involved in it. This is what precisely the present book aims to do.

No book of readings of this size can do justice to all the ramifications of the university examination system in India. That is why it has been thought advisable to confine this volume only to practical problems in university examinations. Theoretical issues of psychometrics or educational measurement have been rather deliberately avoided.

We have imposed another well considered constraint on the papers by assuming that undergraduate stage is the most crucial for any discussion of examination problems in the universities, especially those of practical nature. Accordingly, the spotlight is mainly on the undergraduate examinations.

Furthermore, there may be two approaches to examination reform in the universities: (1) Changing the basic structure of the system and evolving an entirely new pattern, and (2) Planning improvements in the present framework itself. The book implicitly adopts the second approach. Various papers, therefore, will appear as attempts at exploring the possibilities of refinement without altering the present edifice of our examination system.

The papers have been classified into six sections.

Section I, besides giving an overview, brings out the evolution of the undergraduate examinations in India as also their present status.

Section II deals with confidential operations required to be executed in the examination offices along with spot evaluation and revaluation of answer scripts.

Section III comprises examination aids like question banks and computers.

Section IV deals with statistical innovations, the one that has been tried out by Gauhati University and others which are possible in mass conducted examinations.

Section V touches upon social and curricular aspects like abolishing pass and fail in university examinations, introduction of the semester system and the much talked of malpractices in examinations.

Section VI (the concluding section) contains an Indian bibliography of university examinations in the post-independence period.

Most of the papers were specially written for the book and some of them really at a short notice. We are thankful to all the contributors for making the book what it is how. We also wish to place on record our gratitude for Gauhati University and the National Council of Educational Research and Training, New Delhi for allowing us to use the papers by H.J. Taylor and V. M. Dandekar respectively.

Inspite of our best efforts and the cooperation received from the contributors, we are conscious of gaps and omissions that any book of this kind, would entail. In any case, it would be naive to claim exhaustiveness. We must also disclaim responsibility for the opinions and views expressed in the papers. The ideas contained in the papers do not represent, in any manner, the thinking of the Association of Indian Universities. But for organizational deficiencies, we take full responsibility and would welcome suggestions for improving the same.

AMRIK SINGH
H. S. SINGHA

Undergraduate Examinations—Procedure and Problems

H. S. SINGHA

I—HISTORICAL RETROSPECT

It is simply inconceivable to have any instruction at any level without some sort of evaluation. Throughout the ages, teachers have been developing and using their own evaluation procedures in the course of their instruction. A new dimension was, however, added to the process when tests came to be used as a matter of public policy for ensuring better selections to public offices, for deciding grants to educational institutions or for sheer public relations functions. Examinations owe their present complexion largely to the linking mechanism that they provide between the educational institutions on the one hand and social, economic and political institutions on the other.

As the system has grown historically, examinations at the undergraduate stage, like those at the other stages of education, can be broadly classified as internal and external. Internal examination is essentially a part of the process of instruction and inner organization of a college or a department of the university. It generates only an internal competition among the students i. e. students compete but with their peers in the same institution and not with those of other institutions. There is also a more or less complete identity between the teacher and the *tester*. In an external examination, organization and supervision is externally controlled. It is characterised by almost complete anonymity of testers. Its results have also the implications of inter-institution comparison. These two types of examinations have their own educational dynamics. They also differ in basic assumptions as far as educational theory is concerned. But astonishingly, the university system in India has been accommodating the two types of examinations with remarkable facility. Different roles have made this co-existence possible. Internal examination has generally been used by teachers for their day-to-day work and extenal examination has been doing the job of final appraisal of students' achievement. Recently there have been some signs of conflict. Objections have been voiced against the education system being dominated by external examinations. This led to a feeling in the universities that greater weightage should be given to internal examination in the final assessment of students.

Pre-Independence examinations

The origin of internal examination lies possibly in antiquity. It has obviously been always an integral part of instruction. On the other hand, the history of external examination in India is only a little over a hundred years old. Its beginning may be traced to the establishment of the universities of Calcutta, Madras and Bombay in 1857 as a consequence of Wood's despatch. These universities had inevitably to be modelled on the lines of 19th century British Universities. They, thus, did not have a conscious choice in respect of their examination systems. Two options were open at the time, namely: Cambridge and London Universities The Indian universities chose the latter. Under the former, B. A. degree was awarded after two examinations—one taken in the second year and one in the third with no provision of an M.A. or M.Sc. degree. The University of London offered degree courses in Arts,Law and Medicine and for entering the Arts, Commerce etc., a matriculation examination was prescribed. Only two years' study was required for the B.A. degrees and this was awarded on the result of a single examination. A further two years study was required for the M.A degree. The London pattern was reproduced in the case of three Presidency Universities with one difference. To assure a higher standard for B.A. degree which would be accepted internationally, a longer period of study was prescribed than was customary at London, thus fixing it at four years from the entrance examination instead of two (U. G. C. 1971). The entrance examination, as usual, was called matriculation examination and an intermediate examination after two years, was also introduced. But this matriculation examination became very notorious over the years and was criticized for having a cramping effect on secondary education. It was thought desirable to delink matriculation examination from the universities so as to give secondary stage the status of a terminal stage, in addition to being preparatory for the university stage. Consequently on a recommendation made by Calcutta Unniversity Commission (1917-19) popularly called Sadler Commission, Boards of Secondary Education started coming up in the country with the responsibility of organizing curriculum and conducting examinations at the secondary stage. The matriculation examination was naturally passed on to these State Boards of Secondary Education. The intermediate examination was, however, retained with the universities with the exception of Uttar Pradesh where even intermediate examination was conducted by the Board of High School and Intermediate Education. Except for this shifting of matriculation examination, the education scene in the universities upto 1947 continued to be largely dominated by biennial external examinations.

Post-Independence developments

A significant development in the structure and organization of examinations was necessitated in the post-independence period, by the adoption

of three-year degree courses by the universities at the undergraduate stage.[1] The three-year degree course has now become the accepted pattern of collegiate education everywhere except in the University of Bombay and most universities of Uttar Pradesh. Its introduction had an obvious implication for frequency of examinations. Most of the universities abolished the intermediate stage and changed over to annual examinations in place of biennial examinations. Bombay University has thought it worthwhile to continue with intermediate stage but has introduced annual examinations both at the Intermediate and B. A. stages. In Uttar Pradesh also, the Intermediate stage has been retained with the duration of B. A./B. Sc. being of two years but the examination is held at the end of each year. There are, however, some exeeptions too. Some universities like Calcutta and Jadavpur have accepted the three-year degree course but have not switched over to annual examinations. They prefer to have two examinations one after two years and another after one year.

Educationists were not, however, satisfied with the introduction of three-year degree course with annual examinations. The education Commission (1964-66) stressed the need to improve teaching and evaluation methods and to introduce an element of flexibility in the selection of courses so that students could have more freedom of choice and the tendency to memorise mere information could be drastically reduced. Semester/trimester system came in handy in the situation. Practically all the agricultural universities and no hesitation in adopting the new pattern partly because they were newly established and partly because they were modelled on the lines of Land Grant Colleges in America. The Indian Institutes of Technology were another group of institutions which had their courses organized into semesters. These institutions at the tertiary level provide the first visible indication of American influence on university education in India which had so far been patterned on British lines. The mainstream universities also did not escape this influence. There was a wave of experimentation among them. Even some affiliating universities like Meerut went in whose hog for it.[2] Does semester system suit Indian conditions ? Can it be introduced without bringing about concomitant changes in the examination system like internal assessment and grades ?

1. The three-year degree course had been recommended by the Calcutta University Commission (1917-19) but was not put into effect. This was also one of the recommendations of the University Education Commission (1948-49). The introduction of three-year degree course was latter recommended by the Secondary Education Commission (1952-53). It was endorsed by the Central Advisory Board of Education at its meeting held in February 1954, the Conference of Vice-Chancellors of Universities and Chairmen of the Boards of Secondary Education held in New Delhi in January 1955 and the Association of Indian Universities (at that time Inter-University Board of India and Ceylon) at its meeting held in January 1955 at Patna.

2. A discussion on the semester system at Meerut University is given in J. N. Kapur's paper: 'Semester system at Meerut University' in Section V.

How can the system be modified for affiliating universities ? These are some of the important questions which would go on haunting the university academics.

The above is essentially an account of the structural metamorphosis in undergraduate examinations. Not much was, however, done for the improvement of procedures and techniques of examining so much so that the undergraduate stage even lags behind the secondary stage in many aspects of examination reform. This may partly be attributed to the secondary stage having an organization like the National Council of Educational Research and Training to take care of examination reform. At the university stage, some work was undoubtedly done by the University Grants Commission and the Association of Indian Universities but it was not adequate. Fortunately, both the U. G. C. and the Association of Indian Universities have been more active recently. The U. G. C. has come out with an action plan for examination reform (UGC, 1973) and have adopted 12 universities for its implementation.[3] The Association of Indian Universities has also set up a Research Cell to take up research and development programmes in examination reform. These developments are at least a proof of the awareness of Indian educators for the need for examination reform in the universities.

Examination reform in the universities is still a picture of confusion. As we shall see in the next section, structurally there is a slight trend in favour of semester system. Internal assessment has been approached only half heartedly. There are a number of other innovations which have been tried out by some universities or are being contemplated to be tried in the near future. Revaluation of answer scripts has been introduced by some universities like Jiwaji, Kerala and Poona. Spot evaluation has been introduced by Kerala, Karnatak and Meetut Universities and is being planned by Guru Nanak University. Flying squads have been set up by Jammu and Agra Universities. Letter grades have been introduced by Jawaharlal Nehru University. The question bank is also becoming popular. Poona University has already prepared and published question bank in Physics. Likewise, Sardar Patel University has prepared question bank for preparatory classes. They are now planning to extend question banking to other subjects. M. S. University of Baroda is also planning question banking in some subjects. Some universities like Gujarat and Sardar Patel have attempted to improve their question papers by replacing overall options by internal options.

In the planning of any improvement programme two things are important: (1) Where we are, and (2) Where do we want to go. In this paper we would explore the former in regard to undergraduate examinations. The status study which it purports to summarize was conducted by means of a

3. These universities are: Aligarh Muslim, Andhra, Baroda, Calicut, Gauhati, Jadavpur, Madras, Mysore, Panjab, Poona, Rajasthan and Saugar.

questionnaire sent to all the universities. Nineteen out of seventy six mainstream universities which sent their responses are: Baroda, Bhopal, Dibrugarh, Gauhati, Gujarat, Guru Nanak, Jammu, Jawaharlal Nehru, Jiwaji, Kalyani, Karnatak, Kerala, Kurukshetra, Madurai, North-Eastern Hill, Panjab, Poona, Sardar Patel and South Gujarat. All that we have to say on the following pages would necessarily apply to this set of universities. It can be generalized to give us the picture of the national scene only within the limitations of the representativeness of the sample.

II—NATURE OF PRESENT EXAMINATIONS

The system of present examinations is complex and may be studied from various angles. In this section we shall discuss three of its major aspects bearing on the nature of examinations: (1) Frequency, (2) Introduction of internal assessment, and (3) Techniques of evaluation. Details like mechanics of examination would be dealt within later sections.

Before proceeding to details, one broad generalization may be made here. The examinations at the undergraduate stage have been rather impervious to new ideas. So, there would not be much difference between the past and the present examinations. There have been at the most minor changes here and there. Broadly, they continue in the same mould in which they were cast in the 19th century.

Frequency of examinations

The only change that is clearly perceptible in recent years in undergraduate examinations, is an increase in their frequency. As mentioned earlier, immediately after independence, there was a complete shift from biennial examinations to annual examinations. More recently a trend is showing in favour of replacing even annual examinations by semester/trimester examinations coming after every three to six months. This has been helped by the successful functioning of the system in agricultural universities and I. I. Ts. The position regarding the introduction of semester system in the mainstream universities is given in Table 2.1. It appears from the table that the mainstream universities have proceeded warily in regard to the introduction of semester system. Only Aligarh, Jawaharlal Nehru, Meerut, Roorkee and Sardar Patel Universities seem to have introduced it on a large scale. Other universities, either never attempted it or introduced it in some selected faculties, mainly professional faculties. Even among the professional faculties, engineering and technology seem to be the most popular for the introduction of semester system. It is really surprising that the medical faculty has shown immunity against it.

TABLE 2.1

POSITION OF SEMESTER SYSTEM AT THE UNDER GRADUATE STAGE IN THE MAINSTREAM UNIVERSITIES

Sl. No.	*University*	*Courses having semester system*
0	1	2
1.	Agra	B.A. (Household Art); B.Sc. (Home Sc.); LL.B.
2.	Aligarh Muslim	B.A. (Hons.); B.Sc. (Hons.); B.Com. (Hons.); LL.B.; LL.B. (Hons.).
3.	Allahabad	LL.B.; B.E.
4.	Andhra	B.E.; B. Tech.; B. G.L.; B.L.; B.L.Sc.
5.	Annamalai	B.E.; B.E. (Chem.); B.A.; B.Sc.; B.Com.; B.O.L.
6.	Banaras Hindu	B.Sc. (Ag.); B.B.M.; LL.B.
7.	Bangalore	B.E.; B. Tech.
8.	Baroda, M.S.	B.E.; B.E. (Electronics); B.Sc. (Home Sc.); B. Arch.; B.; Tech. B; Text (Engg. & Tech.); B. Pharm.
9.	Bombay	B.E.; B. Arch.; B.Sc. (Nursing).
10.	Burdwan	B.E.
11.	Calicut	B.Sc. (Engg.).
12.	Cochin	B. Tech.
13.	Delhi	LL.B.; B. Lib. Sc.
14.	Garhwal	LL.B.
15.	Gorakhpur	LL.B.
16.	Gujarat	B.E.; LL.B.
17.	Guru Nanak Dev	LL.B.
18.	Himachal Pradesh	B.Sc. (Ag.); B.Sc. (Microbiology); LL.B.
19.	Indore	B.E.; B.C.E.; B.E.E.; B.M.E.
20.	Jadavpur	B. Arch.; B.Ch.E.; B.C.E.; B.E.E.; B.E. Tel. E.; B.M.E.; B. Met. E.; B. Tech.; B. Tech. (Instrumentation and Electronics Engg.); B. Pharm.
21.	Jammu	LL.B.; LL.B. (Professional).
22.	Jawaharlal Nehru	All Courses
23.	Jawaharlal Nehru Technological	B. Tech.; B. Arch.
24.	Jiwaji	B.E.; LL.B.

0	1	2
25.	Jodhpur	B.E.
26.	Karnatak	B.E.; LL.B.; LL.B. (Special).
27.	Kashmir	B.E.; LL.B.
28.	Kurukshetra	B.Sc. (Engg.); B. Text.
29.	Madras	B.E.; B.E. (Part-time); B.Sc. (App. Sc.); B.Sc. (Medical Lab. Tech.).
30.	Madurai	B.E.; B.Sc. (App. Sc.).
31.	Marathwada	B.E.
32.	Meerut	All Courses
33.	Mysore	B.E.
34.	Nagpur	B.E.; B. Arch.; B. Tech.; B.Sc. Tech.
35.	Osmania	B.E.; B. Tech.
36.	Panjab	B.Sc. (Nursing); B.Sc. (Engg.).
37.	Poona	B.Sc., B.E.
38.	Punjabi	B.E.
39.	Rajasthan	B.E.
40.	Roorkee	All Courses
41.	Sambalpur	B.Sc. (Engg.).
42.	Sardel Patel	Preparatory (Home Sc.); B.Sc.; B.Sc. (Advanced); B.Sc. (Home Sc.); B.A.; B.E.; LL.B.
43.	Saurashtra	B.E.; LL.B.
44.	Shivaji	B.Sc.; B.E.
45.	South Gujarat	B.E.
46.	Sri Venkateswara	B.E.
47.	Udaipur	B.Sc. (Ag.); B.Sc. (Home Sc.); B.V.Sc. and A. H.; B.E. (Ag.)

Based on: *Universities Handbook: India.* New Delhi, Association of Indian Universities, 1975.

It is a cardinal principle in evaluation, that the more frequent examinations are better than the less frequent ones. As such, semester system on the face of it may appear better than the traditional system. But this principle subsumes fairly improved methods of examining and adequare feedback arrangements. Important question to be resolved would, therefore, be whether it is advisable to have semester system without changing the modes of examining. Major advantages of the semester system would seem to lie in the fact that it allows for much greater flexibility and wider choice to students in the matter of selection of courses, and better opportunity to university teachers to concentrate on smaller areas in which they may be doing research. That is why U. G. C. (1971) makes a bold attempt in convassing adaptation of semester system to Indian conditions when they assert that "the semester

system which, in the strict terminological sense, merely implies the division of the academic year into two parts has come to be associated with a credit system, grade system and internal assessment and it is often thought that the semester can neither be effective nor successful if it is introduced without its concomitant parts. It is this misunderstanding about the concept of the semester system that has deterred a number of our universities from trying out the system. The choice is often made between all or none. This is unfortunate." It is not that semester system cannot be questioned. Will not too many examinations be a drain on the teaching time available? Is the fragmentation of syllabus and introduction of examinations at shorter intervals really judicious, as it leads to learning by bits ? Questions like these will have to be thoroughly thrashed out by educators before any decision about introduction of semester system can be taken. Naturally much will depend upon the nature of the university in general and the faculty in which it is sought to be introduced in particular. Circumstances differ from university to university. The most vital difference being between a unitary university and a university of the affiliating type. What is possible in one, may not be possible in another Each university should decide for itself the pattern of the semester system keeping in view the student enrolment, level of instruction, nature of courses and type of the university. One thing is certain, the university system in India will have to live with a dual sysem viz annual examinations in some courses and semester system in others for some time to come.

Internal assessment

Table 2.2 states the position regarding the introduction of internal assessment in the reporting mainstream universities. If we take this set of universities to be a fairly representative cross-section of university education In India, we can safely say that external examination has still a dominant role to play. Although there is a world-wide trend in favour of internal assessment, the attempt by Indian universities is at the most at the stage of experimentation. It is clear from the table that the issue of the introduction of internal assessment is far from being finally settled. At least, universities seem to be chary of introducing it in the major faculties of science and humanities.

Much can be said both for and against internal assessment at the undergraduate stage. While it solves some problems, it may create a few others. Introduction of internal assessment is certainly pedagogically very sound but it brings in practical difficulties which may largely offset the educational advantages. One thing seems to be obvious that internal assessment can be more successful at the post-graduate level than at the undergraduate level. Also it could be more successful in unitary and residential universities than in affiliating universities. The success of internal assessment depends not only on the quality of students but also on the quality of teachers. The things being as they are at present at the undergraduate stage, with proliferation of good,

bad and indifferent colleges, universities' hesitation for the introduction of internal assessment is quite understandable. The upshot of all this is that the introduction of Internal assessment should be accepted in principle but should be put into practice only after adequate preparation and after providing necessary administrative safeguards. To begin with, universities may even have a judicious combination of external examination and internal assessment.

TABLE 2.2

INTRODUCTION OF INTERNAL ASSESSMENT IN THE REPORTING UNIVERSITIES

University	*Faculty*	*Percentage of total marks reserved for internal assessment*
1	2	3
Baroda	Education and Psychology	100
	Arts, Science, Commerce, Medicine, Engineering & Technology, Home Science, Fine Arts & Music	30
	Polytechnics	20
Bhopal	Education	40
	Law	14
Dibrugarh	Arts, Science, Comm. of Pre-degree Course (Theory)	10
Gauhati	B.Sc. (Practicals)	50
	B.E.	33-53
	M.B.B.S. (Theory)	12-21
	M.B.B.S.(Practicals)	23-50
Gujarat	Arts, Science, Commerce, Medical Pharmacy (Theory)	30
	Pharmacy (Practicals)	40
	Engineering	50
Guru Nanak	Science & Commerce	5-10
Jammu	Science (Practicals), Music(Practicals) and Home Science	50
JNU	All Schools of Studies	50
Jiwaji	No internal assessment	
Kalyani	No internal assessment	
Karnatak	Education	30
	Engineering	20
Kerala	Medical	25
Kurukshetra	Education	10
	Engineering	30-50
Madurai	Rural Development (B.Sc.)	100
North-Eastern Hill	Science (Practicals)	25
Panjab	Arts and Science	5
	Commerce	20
	Education	30
	Engg. & Technology	32-35

1	2	3	1	2	3
	Home Sc. (B.Sc.) (Pre-Med/Pre-Engg. (Physics, Chemistry and Biology)	25 7		Engineering	20
Poona	Arts; Mental, Moral & Social Sciences; Science, Commerce (Pre-degree level)	20	*Sardar Patel*	Arts, Science, Commerce, Home Science, Law & Engineering and Technology	30
	Science (B.Sc. Part II, semesters I to IV)	5		Education	40
			South Gujarat	Arts, Science and Commerce	20

Techniques of evaluation

As far as the techniques of examining are concerned, they continue to be dominated largely by the traditional essay type written tests in which students are required to write long answers to 5 or 6 questions out of a total of about 10. Of all the reporting mainstream universities, only Baroda and Kalyani are reportedly using objective type questions, the former in the departments of home science and education and psychology and the latter in the faculty of agriculture. Oral tests also do not seem to find favour with the universities. Besides sometimes making oral testing a part of practical examinations, only Jawaharlal Nehru (All faculties), Baroda (Home Science, Education and Psychology), Kerala (Engineering and Medicine) and Karnatak (Medicine) are using oral examinations. Open book examination is not being used by any of the reporting universities.

Improvement of techniques of evaluation is a very important area of examination reform. Unless the techniques of examining are scientifically designed, mere structural changes do not improve the efficiency of the system. Surprisingly, very little has been done in this field. Whatever approach is adopted, the improvement of written examination would occupy a central position. The model of objective testing which is widely used in many foreign universities is, of course, available but the advisability of using it at the undergraduate stage particularly in the present social circumstances may have to be carefully examined. It may be desirable to have a judicious combination of essay type and objective type questions as is being done by some State Boards of School Education. This will have the added advantage that the students at the undergraduate stage will be already familiar with it from their school days. The feasibility of using open book examinations at the undergraduate stage in some faculties like that of Law may be carefully studied. The techniques of evaluation may even by extended to the use of oral testing especially in faculties with low pupil: teacher ratio.

III—TASK OF EXAMINING

There are two major dimensions of the task of examining: one, the formalism with which it is required to be executed and two, the physical arrangements for doing so. Formalism is an essential part of the external public examinations. They require elaborate planning and preparation on the part of university offices, adequate allocation of time for their conduct and large scale involvement of teachers. Added to this formalism is the confidential nature of operations which makes management of examinations a matter of special administrative effort. As such the universities invariably need well organized machineries for looking after examination work.

The physical arrangements for examinations are becoming increasingly difficult. On the one hand there is the recent explosion of knowledge which calls for new approaches to teaching and testing and makes the academic side of examining more difficult. On the other hand, there is a greater hunger for knowledge. This is especially acute in developing countries where the national development makes greater demands for university trained man-power. There are also political and social pressures because higher education is many times seen as an important instrument of social mobility. The Governments are compelled to adopt an open doors policy with alarming consequences for the universities. They have a flood of students with the result that class-rooms become over-crowded and examination halls present a picture of chaos. The Governments do try to meet the situation by opening new universities. This is what happened in India. In 1947, there were only 19 universities while now we have as many as 100 universities

TABLE 2.3

GROWTH OF UNIVERSITIES IN INDIA

Year	*Total number of universities*
1860	3*
1870	3
1880	3
1890	4
1900	4
1910	4
1920	8
1930	15
1940	16
1950	27
1960	45
1970	83
1975	100

*The first 3 universities were established in 1857.

and 10 deemed universities. As will be seen from Table 2.3 there has been a sharp increase in the number of universities after the attainment of independence. In a single decade 1961-70 as many as 38 universities were opened. This should naturally be expected to relieve pressure on teaching departments and examination offices. But opening of new universities is an expensive affair and therefore expansion of higher education can seldom keep pace with the demand for it. This only means that the pressure of numbers would continue to mount. The solution perhaps lies in radically changing the examination system and introducing modern educational technology, in teaching—learning—testing system.

Besides ever increasing enrolment, the university offices have to face another self-created problem. This concerns the increased frequency of external examinations. Without altering the system a whit there was a change over from biennial examinations to annual examinations and now there is an attempt by many universities to shift over to semester system with a consequent increase in the frequency. There is also an attempt to be fair to the students by instituting supplementary examinations. Thus we find that most of the universities are conducting examinations at least twice a year.

We, however, sometimes fail to feel the formidability of the task of examining. We are so much conditioned to the system that even when we see teaching being suspended for weeks together and examination halls being besieged we accept the system as a necessary evil. This may also be partly because of vested interests. The present system of examinations definitely involves lot of money. A conservative estimate is that every college/university teacher is earning on the average as much as one month's salary from examinations. And then it gives senior teachers authority to distribute favours. These vested interests are a sure source of resistance to any examination reform movement. Education Commission's (1964-66) recommendation to abolish payment of remuneration to examiners have not been accepted by most of the mainstream universities. The agriculture universities and IITs have however evolved examination systems which are largely free from this malady. A basic question that needs to be resolved is: Why should teachers not take up examination work as a part of their duties?

Number of examinees

Table 2.4 depicts the volume of examination work in respect of the number of students handled by the universities in their main examinations during 1972-73 and 1973-74 as also the growth rate in the number of examinees at that point of time. Even in the absence of data from bigger universities like Calcutta and Madras, the number of examinees handled, at a time, in 1973-74 ranges from 261 in Jawaharlal Nehru University to 1,98,486 in Panjab

TABLE 2.4
NUMBER OF STUDENTS EXAMINED BY DIFFERENT UNIVERSITIES IN THE MAIN EXAMINATIONS OF 1972-73 AND 1973-74

S. No.	University	Faculty of									Total		
		Arts including Commerce			Science			Professional					
		No. of students examined in the year		1973-74 index (1972-73 =100)	No. of students examined in the year		1973-74 index (1972-73 =100)	No. of students examined in the year		1973-74 index (1972-73 =100)	No. of Students examined in the year		1973-74 index (1972-73 =100)
		1972-73	1973-74		1972-73	1973-74		1972-73	1973-74		1972-73	1973-74	
0	1	2	3	4	5	6	7	8	9	10	11	12	13
1.	Dibrugarh	4704	3258	69.3	3022	695	23.0	390	814	208.7	8116	4767	58.7
2.	Gauhati	6086	36218	595.1	1809	8685	480.1	552	860	155.8	8447	45763	541.8
3.	Guru Nanak	48198	47536	98.6	8692	8876	102.1	3286	3179	96.7	60176	59591	99.0
4.	Gujarat	66372	77187	116.3	15472	14681	94.9	12276	12972	105.7	94120	104840	111.4
5.	Karnatak	11019	13604	123.5	3387	3740	110.4	1925	2743	142.5	16331	20087	123.0
6.	Kerala	12962	14600	112.6	10185	9533	93.6	3485	2995	85.9	26632	27128	101.9
7.	Kurukshetra	3132	4086	130.5	999	990	99.1	4099	4285	104 5	8230	9361	113.7
8.	Jammu	10414	11302	108.5	4405	4809	109.2	—	—	—	14819	161 1	108.7
9.	Jawaharlal Nehru	201	261	129.8	—	—	—	—	—	—	201	261	129.8
10.	Jiwaji	17423	18530	106.4	5837	5745	98.4	1842	3975	215.8	25102	28250	112.5
11.	Madurai	23826	30728	129.0	15701	16342	104.1	3801	3876	102.0	42328	50946	120.4
12.	Panjab	164949	172062	104.3	17076	15919	93.2	11123	10505	94.4	193148	198486	102.8
13.	Poona*	—	—	—	—	—	—	—	—	—	132719	160000	120.6
14.	Sarda- Patel	1193	1289	108.0	230	369	160.4	876	922	105.3	2299	2580	112.2
15.	South Gujarat	18980	19390	102.2	5671	4354	76.8	4770	2862	49.5	29421	26606	90.4
	Total	389459	450051	115.6	92486	94738	102.4	48425	49988	103.2	662089	754777	114.0

(*Note:* Data from M. S. Baroda, Bhopal, Kalyani and North-Eastern Hill Universities were not available for the relevant years)
*Faculty-wise break-up not available.

University.[4] But more alarming is the fact that these numbers are increasing. Columns 4, 7, 10 and 13 of Table 2.4 give the rates of growth in the number of examinees for various faculties and the aggregate. In the faculty of Arts including Commerce, there is an increase in most of the universities, the overall index for 1973-74 with 1972-73 taken at 100 comes to 115.6. In Science and Professional faculties some universities have reported decrease in the number of examinees but there is still a slight over-all increase with the indices for 1973-74 coming as 102.4 and 103.2 respectively. For the total number of undergraduate students examined, the index for 1973-74 is 114.0 as compared to assumed 100 of 1972-73.

This parameter of the volume of examination work often raises the question of the optimum number of examinees that can be handled by a university. It is, of course, inextricably connected with the optimum size of the university and would not admit of a simple answer. Nonetheless, it is a safe assumption that we can examine as many students as we can teach unless we make examinations more complicated than teaching. With a little imagination and foresight, it should not be difficult for the universities to evolve examination systems which are administratively convenient and which they can run efficiently for the students whom they are teaching confidently.

Number of examination centres set up

How difficult and gigantic is the task of actual conduct of examinations becomes clear from Table 2.5 giving the number of examintation centres set up by the various reporting universities during the year 1973-74. The average of the total number of centres set up by the universities comes to 73. Therefore, we can have a guess estimate that more than 5,000 centres are being anually organized by the mainstream universities at the undergraduate stage. And this would, by any standards, be a colosasl task. On the top of it, the average of the number of centres in the university towns is to that of those outside the university towns as 13:60. Thus, more than 80% of the centres have to be necessarily outside the university towns which in terms of sheer management of men and materials makes the task still harder as they are all centrally controlled.

It is high time for the universities to modernize the conduct of examinations. De-centralisation may help to some extent but it should not be expected to work as a panacea. Universities would have to think of some novel methods of conducting examinations depending upon their own ingenuity and resources, both financial and educational.

4. Panjab University in terms of enrolment would be about the third largest university in India in 1973-74, preceded by Calcutta and Madras.

TABLE 2.5

CENTRES OF EXAMINATION SET UP DURING 1973-74

S.No.	University	Number of centres in		
		University Town	Other Towns	Total
0	1	2	3	4
1.	Bhopal	11	7	18
2.	Dibrugarh	4	33	37
3.	Gauhati	21	108	129
4.	Gujarat	25	44	69
5.	Guru Nanak	20	74	94
6.	Jiwaji	13	8	21
7.	Karnatak	16	87	103
8.	Kerala	13	93	106
9.	Kurukshetra	8	1	9
10.	Madurai	16	84	100
11.	North-Eastern Hill	6	11	17
12.	Panjab	26	264	290
13.	Poona	1*	61	62
14.	Sardar Patel	8	3	11
15.	South Gujarat	6	16	22
	Total	194	894	1088
	Average	13	60	73

(*Note:* Data from the universities of Baroda, M. S., Jammu, Jawaharlal Nehru and Kalyani were not available.)

*More places.

Number of question papers produced annually

An idea about the scale at which undergraduate examinations have to be organized by the universities can be had from Table 2.6 giving the number of undergraduate question papers got set during the year 1973-74. The overall average number of question papers, excluding practicals, for the reporting universities comes to 909. At this rate it would not be wrong to expect the universities to produce about 70,000 question papers in a year at the undergraduate stage alone. Getting about nine hundred question paper per university set, printed, stored and distributed in a strictly confidential manner is certainly a herculean task. It would really be an interesting exercise to compute how many thousands of tonnes of papers are used to print them in these days of paper shortages. The amount of paper required to answer these traditional question papers would certainly reach astronomical dimensions. The former may appear unavoidable unless the system of examinations is radically transformed. For the later, however, there is as

TABLE 2.6

NUMBER OF QUESTION PAPERS SET DURING 1973-74
(Excluding practicals)

S.No.	University	Question Papers			Total
		Arts and Commerce	Science	Professional faculties	
0	1	2	3	4	5
1.	Baroda, M.S.	120	38	163	321
2.	Bhopal	470	204	817	1491
3.	Dibrugarh	265	87	111	1263
4.	Gauhati	259	124	242	625
5.	Gujarat	200	90	125	415
6.	Guru Nanak	617	84	393	1094
7.	Jammu	210	84	—	294
8.	Jawaharlal Nehru	—	—	—	662
9.	Jiwaji	368	170	732	1270
10	Kalyani	27	80	125	232
11.	Karnatak	384	80	204	668
12.	Kerala	603	230	560	1393
13.	Madurai	397	210	526	1133
14.	North-Eastern Hill	170	80	48	298
15.	Panjab	1017	352	1445	2812
16.	Poona	—	—	—	1000
17.	Sardar Patel	292	105	76	473
	Total	5399	2018	5567	15444
	Average	360	135	371	909

(*Note:* Data from Kurukshetra and South Gujarat Universities were not available.)

simple a solution as introduction of objective type questions if they can be accepted by the university academics on educational and psychometric grounds.

That our universities are doing the work of setting question papers fairly efficiently speaks remarkably for their organizational capacity. Nevertheless, they must be doing it under a considerable strain. Improvements in the process of production of question papers are not only desirable but necessary. There have been some welcome attempts in some universities in Gujarat and Maharashtra to modify some aspects of question paper production. In place of centralized printing of question papers much before the examination is due they get their papers printed at some regional centres a few hours before the examination, thus avoiding the need of storing and transporting the question papers. This requires a different type of arrangement

but has still to be done in a very elaborate manner. In any event, the pros and cons of it would have to be weighed very carefully.

A question bank particularly if it is set up at Level 3[5] where the questions along with their statistical indices are stored in a computer can bypass some of the steps in the production of question papers and help to facilitate the whole process both academically and administratively. It is high time for the universities to experiment with question banking.

Number of degrees/diplomas offered

Not only is there an exponential increase in the quantum of knowledge, the complexities of society are making additional demands on educated persons. And then there is inter-disciplinary approach to curriculum development. It would, therefore, be natural to expect an increase in the variety of courses and consequently in the number of degrees and diplomas offered by the universities. But it is really surprising that Table 2.7 gives all evidence to the contrary. It seems that our universities have not been very alive to diversification of courses. The number of degrees/diplomas for which examinations have been conducted by the universities have remained fairly constant during the period 1969-70 to 1973-74. Administratively it may be a blessing in disguise because every new degree or diploma introduced by a university means additional work for the examination office.

Time spent on examinations

The above mentioned aspects of the task of examining have a bearing not only on the management of examinations but have serious educational consequences in the matter of time used up in examinations. Some teaching time has to be spared not only for the actual conduct of examinations but also for their preparation. This latter, although may seem avoidable, has become an accepted norm in the institutions. This time for preparation is many times provided unofficially but it has the effect of doubling the time consumed by examinations. The average time spent by the reporting universities on the actual conduct of examinations in Arts including Commerce, Science and Professional faculties comes to 16, 20 and 18 days respectively. The average time set apart for preparing for examinations in these faculties in the same order comes to 22, 22 and 20 days respectively. Thus the universities are spending about 6 weeks on examinations, and all at the cost of instruction. Is it prudent to spend so much time on examinations which should legitimately be spent on teaching? It goes without saying that in the days of ever-deepening curricula there is a need to conserve more and more time for teaching.

5. For a discussion on various levels of question banking see 'Question banks in the univresities' by the author in Section III.

But how could testing time be reduced is certainly a ticklish matter. Short of overhauling the system, there is no way out of the situation. A broader strategy should be to accomplish this through reduction of emphasis on external examination. Tactics may, however, be worked out by individual universities. Within the framework of present external examinations, introduction of objective type questions can also help to some extent as they can be answered in a shorter time.

TABLE 2.7

NUMBER OF DEGREES/DIPLOMAS OFFERED BY THE MAINSTREAM UNIVERSITIES

S.No.	*University*	*Number of degrees-diplomas offered in*				
		1969-70	1970-71	1971-72	1972-73	1973-74
0	1	2	3	4	5	6
1.	Borada, M.S.	73	68	76	84	74
2.	Dibrugarh	10	10	10	10	10
3.	Gauhati	21	21	21	21	21
4.	Gujarat	20	20	21	20	20
5.	Guru Nanak	@	64	67	72	72
6.	Jawaharlal Nehru	3	3	4	4	4
7.	Jiwaji	9	9	9	9	9
8.	Kalyani	5	5	5	5	5
9.	Karnatak	19	19	19	19	19
10.	Kerala	20	20	17	17	17
11.	Madurai	10	12	12	12	13
12.	North-Eastern Hill	*	*	*	*	5
13.	Punjab	54	54	54	54	56
14.	Sardar Patel	15	15	15	12	12

@First examination was conducted in 1970-71.

*The university was established in July 1973.

(*Note*: Figures from the reporting universities: Bhopal, Jammu, Kurukshetra, Poona and South Gujarat are either not available or are not clearly given.)

IV—QUESTION PAPER SETTING

An important step in the mechanics of examinations is that of paper setting. It is unavoidable in the type of testing that we have. A stereotype that emerges from the details sent by the reporting universities is that they differ very little in their procedures for setting question papers. Paper setters are being appointed by the universities in more or less the same manner. Every university believes in remunerating them for the work of paper setting at rates which are not much different from each other. Only in respect of moderation is there some difference in approach. This good degree

of uniformity implies that either the system is working very well and every university feels like adopting it or we are so bankrupt of ideas that we cannot think of any other model.

Appointment of paper setters

The appointment of paper setters in a subject generally passes through three stages: (1) Preparation of panels of paper setters by the Board of Studies, (2) Secrutiny by a specially constituted committee, and (3) Final approval by the Syndicate/Executive Council/Academic Council. In most of the universities, the Board of Studies in a subject do the most crucial and preliminary work. They suggest the panel from which paper setters may be picked up. The recommendations of the Board of Studies are considered by a specially constituted committee called the Revising Committee or Examiners' Appointment Committee etc. It may modify the recommendations of the Board of Studies. The recommendations of this Committee are then sent to the Syndicate for final approval. Only a few universities have thought of cutting short this process by one stage.

More often than not, there is no regular procedure or machinery for getting the names of persons eligible to become paper setters. Most probably the members of the Board of Studies depend upon their own information and personal contacts. It is not, therefore, impossible to include names on reciprocal basis or as a matter of showing favour. This is what leads to vested interests in examinations. The universities could well be wise in maintaining directories of paper setters which would have to be kept up-to-date possibly through regular press announcements. This would naturally obviate some of the difficulties in the preparation of panels of good and willing paper setters.

The present procedure of stage-wise consideration of the names of paper setters has administrative difficulties too. It makes it difficult for the examination offices to maintain secrecy about the names of paper setters. The universities should preferably have a much simpler method, possibly only one stage method.

Restrictions on examination work by paper setters

It is sometimes alleged that because of the way paper setters are appointed, senior faculty members get a lion's share. They get too much examination work to cope with it, with the result that efficiency of the system is reduced. This also causes frustration among junior faculty members. It is, therefore, sometimes suggested that there should be some restriction on examination work undertaken by teachers. The universities have not perhaps found it feasible. Most of them do not insist upon any undertaking from paper setters in regard to the total load of examination work. Some

universities that have cared to put these restrictions have mostly done so only for their own examinations. For example, Guru Nanak University does not normally give any other assignment to a paper setter except if it were minor one and the remuneration did not exceed Rs. 200/-. Similar stipulations exist in Panjab University as well. Sardar Patel University does not give more than two papers to one person. Also for outside work permission of the university is required and it is granted upto a reasonable limit subject to the condition that university examination work does not suffer. Bhopal, Jiwaji, Madurai and Poona Universities take some undertaking. Bhopal University is putting a limit of Rs. 1500 for the medical faculty and Rs. 1200 for other faculties. In Poona University there is a restriction on university teachers that total remuneration should not exceed Rs. 2000. Karnatak University has put the ceiling at Rs. 3000 in a year from examination work.

Proportion of external paper setters

A practice that has been traditionally accepted by the universities is to have a large proportion of paper setters from outside. As is clear from Table 2.8, most of the universities tend to have at least 50% external paper setters at the undergraduate stage. Quite a few of them go even upto the maximum to 100%. Perhaps much can be said both for and against this tradition. Papers set by internal paper setters can reasonably be expected to be more valid than those by external examiners. If the purpose of examinations is to test what students know and not what they do not know, papers set by internal examiners have every reason to be recommended because they are in a better position to reflect the curriculum as it prevails in the classes. On the contrary, external paper setters may be thought of as a necessity in the context of prevailing atmosphere of unfair means. It may also be argued that it ensures objectivity and anonymity of paper setters and helps in maintaining educational standards.

A method which has not yet become popular, but is in any case worth a trial, is to have the papers set by a panel instead of by a single paper setter. The members of the panel who should largely be internal would round off each others idiosyncracies. If the panel prepares more than one question paper—preferably three or four—and the examination office has the option of using any one of them, we can ensure anonymity as well as secrecy to some extent. This method helps in many other ways besides improving the quality of question papers. As we shall see in the next section, it eliminates even the need for moderation of question papers.

Moderation of question papers

A natural corollary to the tradition of getting question papers set by external examiners is to have them moderated by some knowledgeable persons.

External paper setters are not very much familiar with the way the curriculum operates in the actual class-room situation. They only know it in its

TABLE 2.8

PERCENTAGE OF EXTERNAL PAPER SETTERS AT THE UNDERGRADUATE STAGE

S.No.	*University*	*Percentage of External Paper Setters*	*Remarks*
0	1	2	3
1.	Baroda, M.S.	50	
2.	Bhopal	25	All external paper setters have to be from M.P.
3.	Dibrugarh	50	
4.	Gauhati	—	There is no fixed percentage. It depends on suitability and availability of candidates.
5.	Gujarat	50	
6.	Guru Nanak	100	Except for pre-university and Pre-medical etc.
7.	Jammu	25-30	
8.	Jawaharlal Nehru	N.A.	
9.	Jiwaji	50	
10.	Kalyani	50	
11.	Kerala	100	
12.	Karnatak	0-50	In Arts and Science, only a few paper setters are from outside. In professional faculties 50% are from outside.
13.	Kurukshetra	50	
14.	Madurai	100	
15.	North-Eastern Hill	100	
16.	Panjab	—	No. fixed proportion.
17.	Poona	33-50	
18.	Sardar Patel	50	This does not apply to faculties following Semester System.
19.	South Gujarat	50	The practice is, however, being dropped.

printed form. As such, they are likely to over-shoot or under-shoot the target in testing. It is to overcome this that universities resort to moderation. Obviously there is a lesser need for if is question papers are set internally by those who are fully acquainted with extensity and depth of the curriculum.

The universities do not show any clear-cut trend in regard to moderation of question papers. They are almost equally divided as those having no provision for moderation and those having some sort of moderation. Proce-

dures of moderation, wherever it exists, also vary from moderation by Boards/ Committees to moderation by concerned Head of the Department or some subject experts appointed by the Vice-Chancellor.

There are at least two ways of avoiding the necessity of moderating question papers after they are set. One method, as we have discussed above, lies in getting the papers set by panels. As it presumes a thorough discussion on all aspects of the design of a question paper like: weightages to insstructional objectives, topics, forms of questions and levels of difficulty, this would provide auto-moderation. Alternatively the Boards of Studies may work out the design which may then be supplied to the paper setter. An adherence to the design by the paper setter also ensures automatic moderation.

Time given for paper setting

It is difficult to say with any definiteness as to how much time is really required for setting a good question paper, for much would depend upon paper setter's own capability and engagements. But let us not visualise a question paper being set during a railway journey from one station to another. A good paper requires careful designing (if the design is not provided), scientific selection or preparation of good questions and meticulous editing to improve the precision of the language. Generally paper setters should also be expected to provide a marking scheme or outline answers along with the question papers. This would need additional time. Furthermore, it may be a good idea to allow a gestation period of at least two weeks between the first draft and the final version of the question paper.

The universities at present are giving on the average three weeks for setting a question paper. It appears to be on the low side in view of the care and labour required in setting really good question papers. It may therefore be suggested that universities should be more liberal in this matter and give a notice of at least two to three months to their paper setters.

Remuneration for paper setting

As things stand at present, every reporting universities with the exception of Jawaharlal Nehru University is making some payment for getting the question papers set. The most frequent payment for undergraduate question papers is between Rs. 50/- to Rs. 60/-. Gauhati University seems to be making the least payment of Rs. 30/- for pre-university question papers and Rs. 35/- for T.D.C. Part I and II (Pass). Maximum remuneration perhaps goes upto Rs. 100/- as in Kerala University.

The whole question of remuneration for setting question papers is highly controversial. Some may agree with the Education Commission (1964-66), for abolishing it altogether. As pointed out earlier this practice understandably

leads to vested interests and builds up a resistance movement to any examination reform programme. Even otherwise it appears preposterous to reward teachers for examination work which should naturally be a part of their duties. But difficulty may arise when question papers have to be set externally. In that case there may perhaps be some justification for making payment; nay, it may even be contended that the remuneration being paid by the universities at the moment is inadequate in the context of rising prices. It has surely remained unrevised for a long time. There is every reason to provide sufficiently attractive rates to get good external paper setters. The easiest way seems to lie in getting the question papers set by panels consisting mainly of teachers from the colleges/university departments who may not be paid. The very invitation to work on the panel would be its own reward in the form of recognition of scholarship and experience.

V—ACTUAL CONDUCT OF EXAMINATIONS

The actual conduct of examinations represents the culmination of the process of examining. It is here that students react with the tools of testing to give evidences about their academic achievements. As it amounts to making public what is very private to students, this stage creates the maximum tension for them. The permanency of the stamp also contributes to this tension. The whole atmosphere becomes charged with it, affecting homes and institutions alike, although for different reasons.

At the time of conduct, everything seems to stop for examinations. Every place of higher education becomes a place of examinations. Teachers assume the role of supervisors. It is often a struggle between the students who try to beat the systems and teachers who try to maintain whatever is left of the sanctity of examinations. A recent survey of unfairmeans conducted by the Association of Indian Universities reveals that we have maximum amount of malpractices at this stage.[6]

There are quite a number of things that may be studied in connection with the conduct of examinations. We shall, however, confine ourselves mainly to the way students are assigned and seated at various centres of examination, how invigilation staff are appointed and paid and how examination centres are inspected and assisted for smooth functioning ?

Assigning the students to centres

There seems to be complete uniformity in the mode of assigning students to various centres of examination set up by the universities. As far as regular

6. A detailed report of the survey of unfairmeans conducted by the Association of Indian Universities is given in 'Anatomy of unfair means in university examinations' in Section V.

candidates are concerned almost all universities assign them to the centres at their own place of study which may be the affiliated college or the university department. Private students are generally given an option to choose their centres. Sometimes, as for example in Bhopal University,they are assigned to the college through which they send their application forms. Also, sometimes regular and private students sit together in the same examination centre while at times there are separate centres for private students.

Invigilation staff

There is no clear cut pattern in the methods of choosing the staff for manning the examination centres. Most frequently universities appoint the Principal of the college where the centre is located to act as as Officer Incharge/ Centre Superintendent/Chief Supervisor. He is also authorised to recommend the names of invigilators. In Karnatak University, for each centre a minimum of two senior Supervisors are appointed of whom one is the Principal of the college and the other is from out side. In Guru Nanak University the Superintendent may be an outsider but the Deputy Superintendent is generally from amongst the members of the teaching staff of the college.

It would appear from Table 2.9 that most of the invigilation staff is generally taken from the institution where the centre is situated. The percentage of local staff is seldom less than 50 while in majority of cases it goes upto even 100. This should be administratively and financially workable unless we suspect the students of conspiring with their own teachers.

As regards the number of students an invigilator is required to handle, Table 2.10 speaks for itself. The number per invigilator ranges from 20 to 40. The average number of students per invigilator for the reporting universities comes to 31. What could be the optimum number of students which can be efficiently supervised by one person would remain a moot point. But malpractices in examinations are so rampant that it is easier to suggest that we should have smaller number of students per invigilator. This may, however, increase the cost of examinations.

Every reporting university with the exception of Jawaharlal Nehru University and Kalyani University pay some remuneration to invigilationstaff. The rates vary from university to university but would seldom exceed Rs. 25/- per day for the Superintendent and Rs. 12/- for an invigilator. Perhaps all the observations that were made in regard to the remuneration for paper setters can well be made for remuneration to invigilators. In fact there is a stronger case for abolishing remuneration for invigilation. Invigilation cannot be justified as extra work because teaching, in all events, is suspended during examinations.

Arrangements at the centres

The variety that we see in the matter of norms for spacing of students in the examination halls only speaks of their arbitrariness. Bhopal and Kerala

TABLE 2.9

PERCENTAGE OF THE LOCAL INVIGILATION STAFF (i.e.) BELONGING TO THE SAME INSTITUTION WHERE THE CENTRE IS LOCATED

S.No.	*University*	*Percentage of local staff*
0	1	2
1.	Baroda, M.S.	*
2.	Bhopal	66
3.	Dibrugarh	90
4.	Gauhati	100
5.	Gujarat	100
6.	Guru Nanak	50
7.	Jammu	50
8.	Jawaharlal Nehru	N.A.
9.	Jiwaji	95
10.	Kalyani	100
11.	Karnatak	100
12.	Kerala	100
13.	Kurukshetra	*
14.	Madurai	50
15.	North-Eastern Hill	100
16.	Panjab	50
17.	Poona	**
18.	Sardar Patel	100
19.	South Gujarat	100

*No fixed proportion
**Details not available

TABLE 2.10

NUMBER OF STUDENTS ALLOTTED PER INVIGILATOR

S.No.	*University*	*No. of students per invigilator*
0	1	2
1.	Baroda, M.S.	30
2.	Bhopal	20
3.	Dibrugarh	30
4.	Gauhati	30–40
5.	Gujarat	25–30
6.	Guru Nanak	40
7.	Jammu	30
8.	Jawaharlal Nehru	25
9.	Jiwaji	25
10.	Kalayani	20
11.	Karnatak	25
12.	Kerala	36
13.	Kurukshetra	40
14.	Madurai	40
15.	North-Eastern Hill	40
16.	Panjab	40
17.	Poona	30
18.	Sardar Patel	25–30
19.	South Gujarat	30

Universities do not pretend to have any norms for the distance between two neighbouring students. The norm is 2' in Madurai University; 3' in Gauhati, Kalyani, Kurushetra and North-Eastern Hill Universities and 4' in Gujarat, Dibrugarh and Jawaharlal Nehru Universities. Sardar Patel and Poona Universities prefer to seat just one student on each bench while South Gujarat University would not mind seating even two on a bench. Guru Nanak and Panjab Universities have reported 14 square feet, Karnatak University 16 square feet and Jiwaji University 20-25 square feet as the normal floor area per examinee. It is rather strange that very little has been done to establish these norms scientifically. At a time when the control of students during the actual conduct of examinations poses a major problem, this assumes added significance. It is not only the norms regarding spacing that are important but those for ventilation and provision of other conveniences at the examination centres will also have to be worked out by the universities.

The problem of law and order inside the examination centres—and many times outside as well—is also becoming increasingly important. The issue requires a reconsideration of the powers to be given to the Officers-in-Charge of the centres. The maximum that the universities are doing at present is to authorise Officer--in-Charge to expel the examinee if he resorts to unlawful activities. Is it really sufficient to check wilful defiance of authority ? Some universities also request police help to maintain law and order outside the examination centres. There is a strong case to give sufficient powers to Officer-in-Charge of a centre to handle an awkard situation in the examination hall rather than being a helpless witness to it. The proposal to give magisterial powers has been talked about for some time but may need further scrutiny. The universities, wherever possible, should also develop a machinery to help the centres in case of emergency. It is not difficult to do so in residential and city universities. In most of the affiliating universities with far flung colleges Officers-in-Charge of examination centres would largely have to depend on themselves with any local help that may be easily available. They are in greater need of being equipped with more powers.

The need to inspect centres with a view to ensuring their efficient running has also been recognised by most of the universities. Arrangements for inspection exist with variation in most of the universities. In one set of universities only an official of the university like : Vice-Chancellor, Registrar, Controller of Examinations or even a junior officer like: Assistant Controller and Assistant Registrar is authorised to inspect centres of examination. But the most common mode is to appoint Inspectors/Visitors of centres from among the senior faculty members like: Professors, Readers, Principals or even Members of the Syndicate.

The inspection of centres gets it added importance because of the prevailing atmosphere of unfair means. Under the present circumstances, there is, of course, a need not only to sit judgement over the arrangements at the

centres but to actually boost the often sagging morale of the invigilation staff. To accomplish this some universities like Jiwaji and Jammu have introduced flying squads.[7] Flying squads differ from ordinary inspection teams in that they are given special powers and are supposed to act with an element of speed and surprise. The idea is worth trying, at least in those universities where the use of unfair means has become chronic and the invigilation staff finds itself demoralised because of menacing social conditions.

Another situations that may sometimes arise at the examination centres is the one when students feel that the paper is partly or largely out of course or too difficult to be within their reach. It is difficult to think of a simple solution to this problem except at the residential universities where senior faculty members and sometimes even paper setters are locally available. That is why in most of the universities nothing can be done on the spot. Students have to take the paper as it is and then make a representation to the universities. The matter is generally referred to the Board of Studies which may give some concession if the representation is sustained. Sometimes, the matter may go to some Committee like Examination Committee or Results' Committee or Complaints' Committee. For example, in Jammu University the arrangement is that "in case of a complaint against the question paper, the same is sent to the Convener of the Board of Studies and this is placed before the Complaints' Committee along with the comments of the Convener. If the paper is more than 50% out of course, re-examination is held. In case the change is less, the Complaints' Committee evolves ways to safeguard the interests of the students". Panjab University, on the other hand, has the following elaborate arrangement for meeting the situation where the question paper is out of course or has unusual questions: "Complaints against question papers are entertained only if they are made by Heads of affiliated colleges/university departments and received by the Registrar by name under a registered cover within seven days of the examination in that paper. The Board of Studies, within a week of the receipt of the complaint or as soon as possible, consider and determine the course in consultation with the paper setter. If the Board of Studies and the paper setter are not able to agree upon the course to be adopted, the decision of the Board of Studies is referred for confirmation to the Vice-Chancellor. And, if the Vice-Chancellor does not confirm the decision of the Board of Studies, the matter is referred to the Syndicate whose decision is final."

7. Agra University was the pioneer in introducing the scheme of inspection of examination centres by flying squads. The colleges affiliated to Agra University were divided into two zones; one, Agra-Aligarh-Mathura Zone and the other, Bareilly-Moradabad Zone. In all nine squads were constituted by the university for the purpose; each squad had 5-6 teachers with one of the senior teachers as its leader. They were provided with taxies and were advised to secure the help of the local police authorities before making the raids at the examination centres. Although, essentially a short term measure, it has reportedly yielded encouraging results. (IUB. 1971).

VI—VALUATION OF SCRIPTS

Examination is nothing but a process of collecting evidence about students' academic achievements. In our system of examinations these evidences are generally in the form of written answers and they have to be quantified through the valuation of scripts. This requires the universities to appoint competent examiners of valuers who could assign numbers to answers. The process is highly complex and perhaps can seldom be done with perfection. Many factors like the competence of the examiner, his own understanding of the subject matter and experience and especially his concept of a good answer affect the way numbers are assigned. There are also sometimes factors outside the examiner like the general lot of answer that he gets and extraneous factors like the handwriting of the examine or his language etc. The examiner's subjectivity remains perhaps the most serious source of error in the marks assigned. There may be no solution to it but universities can make attempts to reduce it as much as possible.

Besides the psychometric problem of improving reliability, the valuation of scripts calls for simple administrative chores like the appointment of examiners, despatch of answer-books to them, deciding about load and remuneration to be given etc. And these are no less important. We shall discuss the position regarding these operations one by one as also about the technical problems of valuation.

Appointment of examiners

The procedures for the appointment of examiners in the universities are as good or bad as those for paper setters. Quite frequently the same Committee/Board is responsible for the appointment of both paper setters and examiners. Most of the universities invite applications for examiners by sending circulars to Heads of Colleges/Departments of the University. A method which has seldom been used is to get the names through open press advertisements. Even in regard to the restrictions imposed for other examination work the procedures are the same as for paper setters. Also in most of the universities, it is a paid job. As in the case of paper setting and invigilation work there can be those who would stand for its abolition as there would be those would argue against its inadequacy.

Despatch of answer-books

In most of the universities, as for example, Baroda, Bhopal, Dibrugarh, Gauhati, Guru Nanak, Jammu, Kalyani, Kerala, Kurukshetra, Madurai, North Eastern Hill, Panjab and South Gujarat the answer scripts are routed to the examiners through the university offices. Only in Sardar Patel, Gujarat and Poona Universities are the answer scripts sent to the examiners direct

from the centres of the examinations. Jiwaji and Karnatak Universities send them both from the examination offices and directly from the centres.

For obvious reasons, the whole operation of despatch of answer scripts has to be executed confidentially. There are really two aspects of the secracy involved in the valuation of scripts: (1) Concealing the identity of students from the examiners and (2) Concealing the identity of the examiners from the students. The former is mainly accomplished by prohibiting the students from revealing their identity in any manner. It is generally insisted upon that they should write only their roll numbers. A further attempt is made to hide the identity of students from the examiners by using dummy numbers. This is a common practice in some or all examinations of Gujarat, Guru Nanak, Jammu, Karnatak, Kerala, Kurukshetra, Madurai, Sardar Patel and South Gujarat Universities. For hiding the identity of the examiner from the students various measures are used. Routing the desptach of answer scripts to examiners through the university offices is mainly aimed at this. This is the most frequent method used by the universities to eliminate students chasing the examiners. A typical operation in this case would be as in Panjab University where "the work regarding allotment of answer books to the examiners is dealt with by the Assistant Registrar (Secrecy) alone. The staff prepares almost equal lots of answer books according to the number of examiners appointed in a paper. These packages are placed in the room of Assistant Registrar who gets these bundles packed in cloth bags by illiterate peons or coolies engaged during examination days and assigns identity number of the examiner to each bundle. The address of the examiner is written by the staff deputed according to the identity numbers marked by the Assistant Registrar. Excepting the Assistant Registrar nobody knows to whom the answer-book of a particular candidate has been sent. All the record in connection with the despatch of answer books remains with the Assistant Registrar till the declaration of the results." This would work very well as long as we are not worried about delay in the declaration of results. But some short cut methods would have to be evolved. Jiwaji University's methods may work in some cases. In this university "to maintain secrecy the examination centres are informed the destination of the examiner concerned. The centre sends answer books to the destination of the examiner as intimated by the university in sealed cloth lined packets addressed as "Self-Gwl". The examiner's number is noted on the packet and the R/R as "Self-150". The R/R when received is then sent to the examiner on his code number."

Gauhati University's experiment for the valuation of answer scripts is worth mentioning. Here the roll numbers are issued on random basis and the despatch of answer books ensures that all examiners would get more or less equivalent bundles. More precisely the scripts from one institution do not go to one examiner but are spread over a large number of examiners. This method would definitely improve the valuation of scripts technically. For

secrecy purposes administrative measures would still be necessary.[8]

Another innovation in valuation of answer scripts which is sometimes talked about is that of 'spot evaluation.[9] It is felt that this takes care of the secrecy involved in valuation and helps in maintaining fairly uniform standards of marking. Among the reporting universities Karnatak, Kerala and Sardar Patel are using spot evaluation' in some of their examinations. Jammu University had also used central valuation upto 1973. Bhopal University tried it on experimental basis but perhaps found it unworkable. They have listed the following difficulties in the use of spot evaluation :

1. The system of central valuation is costly since T.A./D.A. and conveyance charges are to be paid to the examiners.
2. Examiners from outside do not generally cooperate and so the central valuation becomes localised.
3. Considerable space is needed which becomes difficult to arrange.

It goes without saying that 'spot evaluation' definitely gives some technical advantages. If universities are chary of introducing it, it is mainly because of administrative and financial reasons.

Number of answer books allotted to one examiner

The typical number of answer books sent by the universities to one examiner at the undergraduate stage is 300. The minimum of 150 occurs in Dibrugarh and Gauhati Universities while the maximum of 500 is found in Kerala and Madurai Universities. Within the limitations of the data, one is tempted io observe that the universities in the East tend to give less number of answer scripts to an examiner while those in the South tend to allot more of them. This number could well vary depending upon the duration of the paper. There is, however, no clear picture in this regard. There are as many universities that take the duration of the paper into account while deciding about the number of answer scripts to be allotted to an examiner as there are that do not.

Assuming that there is a limit to the number of answer scripts that an examiner can examine in a day, it is clear that the number of answer scripts given to examiners would be a major factor in delaying the declaration of results. It is easy enough to see that one way of accelerating declaration of results could be to have more examiners and to give each one of them less number of answer scripts. It may deepen the problems of comparability of scores. In fact, universities should establish through well designed experiments the average number of answer scripts that an examiner can be reasonably expected to mark in a day. At present most of them assume that examiners

8. For details of the procedure see H. J. Taylor's 'Operation Passmark' in Section IV.
9. For a discussion on how 'spot evaluation' was organized by Agra University, see 'Spot evaluation of answer books' by M. G. Gupta in Section II.

need about 6-7 days for marking 100 scripts. Once this rate of marking is established with fair degree of accuracy it would be easier to determine the number of examiners required to get the results back after a specified time.

Technical problems of valuation

Technically all the problems of valuation centre round the concept of reliability. In fact this lack of reliability of marking is the chief drawback in essay type examinations. It has sometimes been sought to be remedied by the introduction of objective type questions which, whatever their other strengths and weaknesses, do ensure complete objectivity of scoring. This may not be possible on a large scale in Indian conditions. The need of the hour is to improve as far as possible the marking of essay type questions.

The most popular method used by the universities is to send instructions to examiners. This is done by paper setters/head examiners. Sometimes even a meeting of paper setters and head examiners is convened to draw these instructions. On the face of it, this method should work well, provided the marking scheme is detailed enough to cover all possible aspects of the answer and gives its break-up into credit points and the marks for each. In fact as pointed out earlier it should be prepared along with the first draft of of the question paper in which case it would improve even the quality of question paper itself. A further check on the uniformity of standards is to call for a test instalment of about 20 marked answer scripts which are scrutinised by the head examiner and then returned to the examiner with comments. Incidentally universities have not thought it wise to use more scientific methods for ensuring uniformity of standards. The indifference to scaling which we shall discuss in the next section is a case in point. Even 'spot evaluation' which could go a long way in this direction has not become popular.

The subjectivity of examiners could be minimised to some extent by the use of multiple marking, that is, to have the same answer scripts evaluated by two or more persons. Theoretically the more the number of examiners whose marks are averaged, the more reliable would be the score. The only fear in this case is that it would increase manifold the work of the examination branch and also the cost. At the moment, very few universities are using it at the undergraduate stage. Some have, however, introduced it at the post-graduate level. From out of the reporting universities only Guru Nanak and Panjab are using it in some of their undergraduate examinations.

But whatever we do, marks of examiners cannot be made fully reliable. If students complain, rightly or wrongly, that marking has been erratic or harsh it would be in the interest of natural justice to permit re-examination of answer scripts with proper checks and balances so that those students who genuinely feel aggrieved get redressal, and at the same time, the provision is not misused. Incidentally re-examination of answer scripts has already been

introduced by the universities of Bhopal, Jiwaji, Kerala, Kurukshetra, Gauhati, Panjab and Sardar Patel.[10]

VII--PROCESSING OF EXAMINATION RESULTS

The interpretation of scores is the missing link in the present system of examinations. The universities are using the raw scores as obtained from the examiners while to be really useful, they should be processed further for meaningful interpretation. There are many issues connected with it. But the basic question would be whether we should take marks to give absolute measurements or just numbers helping us to put the sudents in order of merit. At present the universities take the former view. This is possibly the reason why marks in university examinations have acquired the sanctity they have.

Scaling of marks

The scaling of marks which involves reducing them to a scale with a known origin and known units of measurements could solve some of the problems of interpretation. It could also facilitate the aggregation of marks. Surprisingly all the universities except Gauhati have fought shy of it. Even Gauhati University is using it for the limited purpose of making the marks of different examiners comparable. They are using median scaling after randomisation of scripts sent to the examiners.[11] Although there is a room for improvement, the experiment at Gauhati remains very bold and pioneer in nature in the context of examination reform movement in India. Some resistance to the use of scaling procedures from the examination offices is natural because of the fear of increased work and the requirements of technically qualified staff. But with the use of mechanical aids and computerisation of examination work, universities should be well advised to avail themselves of the advantages that accrue from scaling.

The finale

The final act in examinations is the judgment that is passed on the calibre of students. Obviously it could either be in terms of numerical scores with their absolutism or in the form of letter grades which are essentially relative in nature. The superiority of letter grades for the purpose of declaring

10. "Revaluation of script" by G. N. Tandan in Section II gives a detailed discussion on re-examination of answer scripts, particularly the way the scheme has worked at Jiwaji University.

11. Full details of scaling methods used by Gauhati University are given in H. J. Taylor's 'Operation Passmark' in Section IV.

results has been repeatedly emphasized.[12] The Education Commission, 1964-66 (Ministry of Education, 1966) went on record to say: "It is strongly recommended that even if the present system of examinations and classifying the results is continued it should be supplemented by giving the relative grading of the student say on a five point scale in the same certificate". Even this sane recommendation of the Education Commission was not implemented by any university. May be that the universities are thinking that the system of divisions in vogue, is as good as letter grades. But this is simply not true. They are based on different assumptions. While divisions are based on the concept of perfection in a subject area, letter grades depend on the performance of the group that take the test and all that goes with it. If world trend is any indication it is certainly in favour of letter grades. The universities should have no hesitation in following it. The fact whether universities should abolish pass/fail in conjunction with letter grade would also engage the attention of those connected with higher education for quite some time.[13]

The way universities decide their cut-off points for various divisions is quite revealing. There is a complete unanimity in the reporting universities regarding the definition of the first division which always begins with 60% marks. Regarding the second division the traditional cut-off point of 50% has been lowered to 48% in some universities like Gujarat, Jammu, Sardar Patel and South Gujarat while some others have pulled it down further to 45% as in Bhopal, Gauhati, Jiwaji, Kalyani and Poona Universities. Similar is the case with the minimum marks for passing. It is 33% in the universities of Bhopal, Dibrugarh, Jammu, Jiwaji and Panjab; 35% in the universities of Guru Nanak, Kerala, Karnatak, Kurukshetra, Madurai and Poona; 36% in Gujarat, Sardar Patel and South Gujarat Universities and 40% in Baroda, M. S. and Gauhati Universities. This only means that cut-off points have been left to the vagaries of administrators even at the cost of disturbing equivalence of degrees. The important question is whether we should have the final result in divisions. And if it is decided to have divisions, should we not base them on scientific principles?

The way final judgment is passed on the students in the universities is a monument to the arbitrariness in examinations. Besides variations in the minimum marks for passing, other criteria for passing also differ from university to university. The most common criterion is to require a separate pass in every subject. Gujarat, Poona and South Gujarat Universities seem, however,

12. For a complete discussion on this topic, see Walker, H. Hill's: 'Grades or numerical marks' in Section IV.
13. The Central Board of Secondary Education has already abolished pass and fail in their examinations. A view point on the abolition of pass/fail in university examinations is given in Salamatullah's paper : *'Abolishing pass and fail in public examinations'* in Section V.

to condone failure in one subject. Some universities allow compartment in one or more subjects under certain conditions of minimum marks in the aggregate and the subject concerned. A better procedure which remains arbitrary to some extent but can be backed on theoretical grounds is to have a slightly lower passing point—say 25% in each subject—than in the aggregate. In this scheme the weakness in one subject could be compensated by better performance in another. It is also based on the principle that marks in the aggregate are more reliable than in an individual subject.

But more intriguing are the ways of disposing of border line cases. The need for grace marks is well recognised but the difficulty lies in evolving technically acceptable methods of awarding them. In almost all universities only some arbitrary methods are used. Some depend on purely ad hoc decisions of bodies like Examination Committee, Results Committee or Board of Examiners. In some universities the quantum of grace marks is laid down in the ordinances of the university sometimes as the number of marks that can be added as in Baroda, Jiwaji and South Gujarat and sometimes as percentage of the aggregate as in Jammu, Karnatak, Kurukshetra and Punjab. There is also sometimes a provision for grace marks not only for passing but also for improving division. Again only Gauhati University has tried to evolve scientific methods. Whatever their limitations, they are using the tables of passing probability for deciding about border line cases.

The most unfortunate aspect of university examinations is that the results have an element of finality and indelibility. Once a third divisioner remains throughout a third divisioner. Unmindful of the possibility of error of measurement, no university except that of Kerala gives an option to its undergraduate students to improve their divisions. How can we really deny this opportunity to the students? More universities, however, appear to nave recognized the need of this provision at the postgraduate stage.

VIII—MANAGEMENT OF EXAMINATION WORK

In spite of the enormity of the task of examining, particularly in view of increasing numbers, the facilities that science provides are not being exploited by the universities in their examination work. Only Bhopal, Gujarat, Karnatak, Poona and Sardar Patel Universities have reported the use of computer or some electronic device in some or all of their examinations. Baroda and Kalyani Universities are content only with the use of calculating machines while others do even without that. The failure of the universities to use modern devices will only be a callous indifference to modern developments.

The examination branch also continues to be organized on traditional lines. The general pattern is to have it as a part of the Registrar's office mostly under a junior officer but sometimes under a Controller of Examinations whose scale of pay may be comparable to that of the Registrar. Only

a few universities like Kerala, Karnatak, Madurai and North Eastern Hill have cared to set up independent units for examination work. At the time when the examination work is becoming more complicated and difficult it may be natural to expect every university to have an independent examination office under a Controller of Examinations whose status should be comparable to that of the Registrar and who should work directly under the Vice-Chancellor.

The universities in India have also never felt the need to have a post-mortem of examination results. Perhaps they do not even recognize that it is a technical matter. Most of the reporting universities have no Statistical Wing or some other arrangement in the examination offices for the post-examination analysis of results and question papers with a view to improving them. If any university has a statistician or statistical assistant, his duties seldom go beyond computation of simple indices like pass percentages. Gauhati University is perhaps an exception here as in some other matters. They have an Examination Reform Unit which was set up long back with the help of the UGC along with some other such centres. While other centres have become almost inactive, fortunately Gauhati centre still goes on producing some research in examinations. That is perhaps the reason why Gauhati University has been a pioneer in innovating many procedures in examinations. This is an example worth emulating by the universities. So much needs to be done in examinations that simple provision of financial resources is not sufficient. What is needed is a technically staffed unit with full time responsibility of conducting research in examinations suggesting changes and, may be, even arranging training and orientation of university teachers in testing and measurement.

IX—CONCLUSION

The features of the present undergraduate examinations may be summed up as: gigantism, traditionalism and adhocism.

The gigantism of examinations is almost obvious. We have not only a multiplicity of operations like: processing of application forms; setting, printing and distributing question papers; arranging the actual conduct; valuing answer scripts and preparation of results but each operation is a giant in itself. The average number of students handled by a university is over 50,000 and this is gradually increasing. Also each university has to set up on the average 73 centres of examination and to produce more than 900 question papers. Computerization of examination work seems to be an easy solution. De-centralization has been often talked about but seldom practised.

Furthermore, most of the examination procedures have become traditionalized over the years. That is why we find so much uniformity in them.

Paper setters are being appointed and remunerated in the same manner. Procedures regarding the conduct of examinations, valuation of scripts, declaration of results etc. also do not differ much. This traditionalism generates its own resistence for improvement programmes. This could be one of the reasons why universities believe in status quo as far as examination system is concerned.

But the worst aspect of undergraduate examinations remains adhocism. Examining has never been taken as a technical task. It has generally been felt to the whims of administrators. That is why most of decisions like cut-off points for various divisions and award of grace marks suffer from arbitrariness. The least that should be done is to give examining the status of a science. This would ensure every decision being taken on sound technical considerations.

If we go by what happens at the time of examinations, we can safely assume that our examination system is in shambles. The main issue concerns their relevance to contemporary needs, both educational and social. Do they serve the needs of the universities? Are they consistent with the current social milieu? These questions are, of course, interilinked with the broader question of the relevance of the education system itself. When the education system is revampend so will be the examination system. Till that is done—and it may take a longer time—universities should evolve a clear cut policy towards undergraduate examinations. It should be aimed at streamlining and modernizing the system with a special emphasis on increasing both its pedagogical and measurement values.

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Confidential Operations in Examinations

C. C. DAVID

I— THE NEED

Examinations constitute a sub-system of education. They, in fact, represent a consummation of the educational efforts in the universities. We should, therefore, expect them to be conducted with the same spirit of openness and freedom as characterizes university teaching and learning. It may even be questioned whether there is any need for secrecy and confidential operations in examinations. It appears that we cannot justify secrecy on purely academic grounds. There are, however, practical considerations which are weighty enough to compel examination offices to resort to it in many of their operations.

Examinations have come to occupy a predominant position in India. They have both educational and social implications as they are required for admissions for higher courses as also for job eligibility. This is true almost everywhere because examinations provide a link between the educational institutions and the socio-economic institutions. We have on the one hand the educational institutions and on the other the social, economic and political institutions in which, as adults, the people will be expected to participate. There are linking mechanisms between the two sets of institutions which assess the extent to which the young are ready to perform assigned roles. One of these is the examination system (Lauwerys and Brian Holmes, 1969). In India, however, this link tends to be rather over-emphasized partly because of our under-developed economy and partly because of historical reasons. A little more than a century ago the British rule of India established the first modern university. The system of public examinations was inaugurated by the universities as a means of selecting students for admission to this highly prized and competitive level of education. University education was the pathway to positions in the government and unprecedently high positions were attained by many of the early graduates. Even those who

appeared for university examinations and were not ultimately successful were able to win positions of considerable importance and prestige. Thus, examinations quickly became a symbol of high achievement in Indian society (Dave and Hill, 1974). With so much depending on success in examinations, there naturally grew many types of undesirable personal and social behaviours among students. Now-a-days, it is not uncommon to find students resorting to unfairmeans at different stages of examining. Even parents and relatives of students try to exert pressure to get the assessment of their wards enhanced. There are cases of impersonation in examinations. But the most commonly used unfairmeans is downright copying during the conduct of examinations. Even after the examinations are over, students and their relatives chase the answer scripts with a view to get the marks altered in their favour. There are also sometimes attempts at manipulations in the examination offices.[1]

Under these circumstances it is quite likely that persons connected with examinations should come under severe economic, political and social pressures which may tend to undermine the very process of examining in the universities. Therefore, in the interest of fairness and accuracy of examination results it becomes imperative for examination offices to identify the sensitive operations and to arrange their execution in a manner that keeps them free from all outside pressures. The Seminar on Examination Reform (IUB, 1971) had rightly recognized the need for confidential operations in university examinations particularly in relation to the appointment of examiners. It felt that in order to maintain secrecy of the names of examiners, the procedure of their appointment should be reviewed and strongly emphasized that whatever mechanism was evolved, the important thing to ensure was that the identity of the examiner did not become public.

II—SCOPE AND NATURE

The conduct of examinations in a university is undoubtedly a highly complex affair. It involves various processes at various stages. While some of them can be carried on openly, there are others where complete secrecy has to be maintained. Important operations which need to be executed confidentially in connection with university examinations are:

1. Setting and moderating question papers including preparation of lists of paper setters and moderators
2. Processing of manuscripts of question papers
3. Preparing code list of question papers
4. Arranging for printing

1. For the extent of unfairmeans of various types in graduate examinations as revealed by a recent survey see Chapter Fifteen on "Anatomy of unfair means in university examinations".

5. Arranging for safe custody of question papers received from the printer and 'filing'
6. Despatching of question papers to officers-in-charge of examination centres and their handling by them
7. Receiving, shuffling and renumbering of answers-scripts received from various examination centres
8. Preparing the list of examiners (evaluators) and issuing of their appointment orders
9. Despatching answer-scripts to examiners
10. Tabulating and moderating marks

In all these operations utmost care is required to be taken so that perfect secrecy is maintained and security ensured consistent with the needs of fairness and efficiency of the university examinations.

Setting and moderation of question papers

The process of setting question papers may be taken to begin with the preparation of lists of paper setters. This involves an intelligent selection of known scholars in various subjects. An easy method for selecting good paper setters would be to have a directory of paper setters which includes names of professors and readers in different subjects from all the universities in the country. Of course, the university will have to evolve a suitable machinery for drawing up the lists of paper setters from the directory, with appropriate safeguards against leakage. At present, in some universities, this list has to be approved by the Executive Council or the Syndicate. But experience has shown that it does not always function well. When the list is placed before a body of persons like the Executive Council or the Syndicate very often it becomes difficult to prevent the names of setters from becoming public. One way out of the situation is that the Controller of Examinations may be vested with sufficient statutory powers to make the selection by himself subject to the approval of the Vice-Chancellor. Constraints under which selections are to be made like: qualifications and teaching experience at the concerned stage or the condition that no one shall be given more than two or three papers to set may be laid down in the university ordinances. It evidently points to the need for having as the Controller of Examinations, a very competent person of known integrity who could inspire confidence and work efficiently at this level. Such an officer may be available only in a scale of pay of heads of the departments in the university, if not more.

In the case of honours and post-graduate examinations, it would be desirable to have each paper set by a specialist. Both for under-graduate and post-graduate examinations there should, in fact, be separate boards of paper-setters with a separate chairman for each one of them. It would be the duty of the chairman to collect the question papers pertaining to his board from other members of the board and to arrange for a meeting of two

or three senior members of the board who scrutinise and moderate all question papers. He would then forward the moderated question papers to the Controller in double sealed cloth-lined covers specially supplied by the university for the purpose by insured registered post. The manuscripts must reach the Controller at least 3 months before the commencement of the examination concerned.

In the interest of secrecy, it is always desirable to have three (or more) question papers set for each paper so that the setters themselves may not know which of the papers shall be used for the forthcoming examination. After the annual examinations, one of the two remaining papers can be used for the supplementary examination, if any, and the third one destroyed.

Processing of manuscripts of question papers

The Controller of Examinations on receipt of the question papers should personally go through each and every question paper and satisfy himself that all necessary instructions like the title of the question paper, duration of the examination, number of questions to be answered, division of questions into required parts or sections etc., have been written correctly and clearly. There should also be no mark or writing on the manuscript of the question paper which may reveal the identity of the setter or the chairman of the board of setters.

Preparation of code lists

As the manuscripts of the question papers and their printed copies are to be handled by the employees of the printing press, the name of the university and the name of the examination should not be written on the question paper. Such details would ultimately lead to the violation of secrecy in the press. For that purpose a code must be devised. The name of the university and that of the examination may be represented by code letters. These letters may be followed by a number representing the particular question paper. This will prevent the revelation of the identity of the university and the examination to the compositors and other staff involved in printing. The code must be changed year after year. It may be changed even in the case of supplementary examinations. Special care should be taken in giving the code numbers to the question papers and the code list should be handled personally by the Controller and his P.A. If the code list is to be typed, list of question papers may be typed but the code must be written in hand by the Controller or his P.A.

Arrangements for printing

It is always safe to have the printing done at a press where there are proper security arrangements. Nevertheless, even if such presses are available locally, a far off station should be preferred. The place at which printing

is done and the address of the printer should be known only to the Vice-Chancellor, the Controller and the latter's P.A. It would also be desirable if the manuscripts of the question papers are taken to the printer personally by the Controller or his P.A. instead of sending them by insured post. If under unavoidable circumstances they have to be sent by insured post, they must be packed in very safe containers and heavily insured with acknowledgement due.

When the printing of question papers is over, the printer should inform the Controller and on receipt of such information, the Controller or his P.A. should go to the press and take delivery of the same. Printed question papers should be transported from the press by special conveyance, or by a special wagon if it involves rail transport. If the quantity is only very limited they may be sent by post but should be heavily insured. In case they are sent by post, it is always better to use a small steel trunk as the container and it should be wrapped and stitched in the double fold hessian cloth.

Safe custody and 'filling'

Safe custody of question papers both before and after printing is very important. Manuscripts should be kept in a special safe meant for the purpose. Besides locking the safe with two keys, a paper seal should also be put on the safe as in the case of ballot boxes.

After receipt of the printed question papers, they should be kept in a specially constructed strong or safe room with steel panelling and steel doors. The keys of this room and the steel almirahs in it should always be in the custody of the Controller. The strong room should never be opened by any body except the Controller.

It is always desirable to have a fairly big safe room, in any case not smaller than 20′ x 30′. Of course, a bigger room is needed in case of bigger universities. The sorting and packing of question papers to be despatched to various centres must be done in the strong room itself. If the Controller, his P.A. and peon by themselves cannot complete this work, some minimum number of persons known for their trustworthiness should be engaged for this purpose. Teachers of the university or of affiliated colleges may not be engaged for 'filling'. It may be desirable to involve even some leading citizens of the locality, who are reputed for their unimpeachable integrity, paying them sufficient remuneration. In any case the number must be not more than half a dozen at the most and they should not only sort out the question papers and fill the cloth lined covers meant for despatch, but should also paste and seal the packets by themselves, instead of leaving it to the peons or attenders.

Despatch of question papers to centres and their handling

Special arrangements must be made for the transport of question papers to the centres. Question paper covers packed in double fold cloth parcels

and sealed with the personal seal of the Controller should be delivered to the officers-in-charge of centres as far as possible either by the P.A. of the Controller or by an officer of the university not below the rank of an Assistant Controller. Despatch by post should be avoided as far as possible. Only under exceptional circumstances postal transmission may be resorted to. The question papers should be delivered to the officers-in-charge of the centres at least three clear days before the commencement of the examinations.

The safe custody of the question papers at the centres is also important. If there are no double-lock steel safes available at the office of the officer-in-charge of the centre, they must be kept at the office of the nearest sub-divisional officer or in the treasury, and if both of them are far away, in the local police station in the box where valuables are kept under police guard. But wherever question paper packets are kept the ultimate responsibility for the safe custody of question papers rests with the officer-in-charge of the centre.

The question paper packets should be opened by the officer-in-charge of the centre a few minutes before the commencement of the concerned examination in the presence of at least one invigilator who is on duty on that day. The officer-in-charge must also satisfy himself—and those present at the time of opening—that the seals of the packet are quite intact before opening. The packets should be opened in the manner prescribed for the purpose without tampering with the seals. The empty packets, without removing the seals, must be sent back to the university on the very same day in a special cover along with parcels of answer-scripts of the day.

Receiving, shuffling and renumbering of answer-scripts

The answer-scripts should be despatched from the various centres to the university office together with the absentee list in respect of each paper. The officer-in-charge of each centre should arrange the answer-books for each paper serially and make them into separate double fold cloth bound parcels. Packets from local centres may be taken to the university by one of the invigilators and delivered to the Controller or to his P.A. and acknowledgement obtained on the same day as soon as each examination is over. Outstation colleges should despatch answer paper packets by insured post on the same day on the personal address of the Controller. The answer scripts of different papers received from different centres should be arranged paper-wise and the scripts in each paper should be shuffled in such a manner that the scripts of any particular college are valued by all examiners for that paper, i.e., each examiner gets a 'random' set of scripts of that paper.

After shuffling the papers, they should be arranged and each paper be given a false number by a numbering machine which prints the same number twice on the facing sheet of an answer book, one very near the registered number written by the candidate and the other at the top of the

facing sheet. The lower portion of the facing sheet bearing the real number written by the candidate and the false number affixed by the numbering machine should be torn off. The facing sheet must be perforated three inches above its bottom edge and that portion should contain nothing but the original number and the false number. This portion, which may be called the counterfoil, should be removed and all the counterfoils should be kept in the custody of the Controller in sealed packets. The answer scripts sent for valuation to the examiners will thus bear only the false numbers printed at the top portion of the facing sheet. The examiers will prepaie the mark sheets making use of these false numbers only. This practice of false-numbering is adopted in many universities and it has been found to be very effective in preventing post examination malpractices. This system saves the examiners from the pressures of examinees and their relatives as the latter are not in a position to know the false numbers given to their scripts. This practice of fictitious numbers has also been decried by many for reasons more than one. It has been pointed out that this practice involves considerable delay in the despatch of answer-scripts for valuation from the university office to the examiners. When the mark-books are received at the university office from the examiners, there is again a delay in decoding and writing the marks against the original numbers. There is also the risk of making mistakes in decording. The critics of this system also condemn it as betraying lack of confidence in the examiners. But with all these, in practice, this system has been found to be very useful, although it necessarily brings about some delay in the publication of results.

Preparation of lists of examiners

Another important operation involved in the conduct of the examinations which has to be carried out confidentially is the preparation of lists of examiners. These should preferably be prepared by the Controller himself from a panel of names already approved by the Syndicate or the Executive Council of the university. The list prepared by the Controller may be submitted to the Vice-Chancellor for approval and the latter may not add any name from outside the panel approved by the Syndicate. He may, however, delete any name from the list prepared by the Controller, if necessary. The lists thus approved by the Vice-Chancellor should be typed by the Stenographer of the Controller and should always be in the custody of the Controller. Each examiner should be given a code number by the Controller of Examinations. Various sections would then deal only with code numbers, the real identity remaining confidential with the Controller.

Despatch of answer-scripts to the examiners

Once the examiners are assigned code numbers and answer-books have been shuffled, re-numbered and distributed into nearly equal sets, despatch

of answer-books to exmainers under complete secrecy becomes very easy. The section charged with the responsibility of packing the answer-books for despatch to the examiners prepares the packets and gives them code numbres. The code numbers are then resurrected into names and addresses by the Controller's section. As a precaution against tampering, the packets should be sent to the examiners by insured post or through special messengers.

Tabulation of marks

Another important item of confidential work is the tabulation of marks. Utmost care should be taken to ensure perfect accuracy and secrecy. Although this work has to be finished as quickly as possible, it should not be entrusted to all and sundry. It is better to select a few reliable and trustworthy assistants from the office itself than engaging teachers from affiliated colleges or schools. It should be done under the direct supervision of the Controller in a secluded room where all facilities are provided for the speedy conduct of this work.

Very often it may be found during tabulation that the pass percentages in most of the subjects are very low and the marks may necessarily have to be moderated. In different universities, there are different kinds of statutory bodies set up for this purpose. But whatever may be the body responsible for moderation, it should not have access to the tabulated mark sheets. This would avoid any bias in fixing the rate of moderation. The members of the Moderation Commitee should be given only the statistics relating to the pass percentage so that decisions taken by them are not influenced by any consideration of partiality or nepotism.

III—CONCLUSION

Thus, because of the way our university examinations are patterned and because of the social order in which they are required to function, a veil of secrecy seems to have become necessary in many, if not all, operations in the examination office. These operations are no doubt complex but it is not beyond human ingenuity to devise easy, efficient and quick methods for managing them confidentially. What is perhaps required is a small but strong confidential section in the examination office consisting of three or four persons of proven honesty and integrity. This section may be headed by the Controller of Examinations himself who should be responsible for the conduct of most of the confidential operations. This also argues the case for a good status for the Controller of Examinations in the university hierarchy. It goes without saying that tight secrecy exercised through an efficient confidential section under the guidance of a competent officer will go a long way in ensuring the sanctity and integrity of examinations.

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In Lieu of an Article

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SIMLA-5

April 2, 1974

Dear Prof. Amrik Singh,

You are doing a great service to the cause of education by focussing attention on controversial issues. You have earned the gratitude of many who are interested in the development of education on healthy lines.

In your letter dated March 12, 1974, you give me credit for the introduction of spot evaluation of examination scripts while I was the Vice-Chancellor of Meerut University. Before detailing or defending the system, kindly permit me to disown the compliment for being the first to introduce the system. The credit for its beginning must go to Shri Ram Swaroop Agarwal, the retired Registrar of the Agra University. He introduced the system in order to expedite the declaration of results of the Entrance Examination for admission to Medical College of that university. This was prior to the introduction of the system in Meerut University in 1967. The mechanism devised by Shri Agarwal was applied in Meerut University to cover a much larger number of students and a much larger area.

The introduction of the system of spot evaluation in Meerut University provides a good illustration of the old saying: Necessity is the mother of invention. The necessity arose from the decision to introduce semester system in 53 colleges of that University located in 25 cities or towns. I am quoting from a brochure written by me in April 1968 entitled 'Innovations and Problems': "In the Meerut University, the usual academic year has been divided into two semesters, the first from July 1 to December 7 and the second from December 8 to May 1. Each semester is to have approximately 100 working days excluding the examination period. There are to be two examinations, from November 17 to November 25 for the first semester, and from April 22 to May 1 for the second semester, with a break of usually

twelve days between the semesters. The necessity was to increase the number of working days to 200 in the year which would be possible only if the period between the 1st and 2nd semester could be reduced to the minimum. The short period of 12 days was ideally conceived. From this arose the necessity of spot evaluation".

The genesis of the system as well as the modus operandi are given below—quoted from my brochure 'Meerut University—Its Present and Its Future':

"The semester system has so far been associated with such residential institutions as have accepted the American pattern of examination and teaching, under which the teachers and examiners are the same persons. Both are internal. There is no doubt, the internal examination, by simplifying the examination procedure, makes the working of the semester system easier. But it would be wrong to suppose that semester system cannot be introduced without internal examination. It is perfectly possible. There is no inherent connection between the two. What is necessary, however, is to plan the examination in such a way that all the scripts are examined during the recess between the two semesters or between a semester and the summer term. The last entrance examination of about 10,000 students for admission to Medical Colleges in U.P. by the University of Agra, in a week's time has amply demonstrated its feasibility. In the University of Meerut a little over 30 thousand students will take different examinations from 53 colleges in 25 cities or towns, not once in the year as would under the existing system but twice or even thrice under the proposed system. The results of these examinations will have to be declared within fifteen days of the last day of the examination.

The examination will have to be specially programmed. The following steps will be essential:

(a) To meet the Statutory requirements that about half of the examiners must be from outside the University, they will have to be grouped into (I) Paper setters and Practical examiners and (II) Examiners or readers of scripts. The former will have to be from outside the University latter from inside. This arrangement as has been mentioned earlier, will also remove the air of suspicion and unhealthy rivalry to which internal examiners from competing colleges give rise.

(b) The scripts will have to be collected in 6-7 centres—Dehra Dun, Saharanpur, Muzaffarnagar, Meerut, Ghaziabad, Bulandshahr and Khurja—where the examiners from the locality will collect to mark scripts under the direction of senior examiners in each subject.

(c) To enforce the principle that no one will examine his own students, the scripts will have to be moved from one cluster of colleges to another, for example, the scripts of the colleges in Dehra Dun

area may be taken to Saharanpur, that of Saharanpur to Muzaffarnagar and Muzaffarnagar to Dehra Dun. Similar arrangements will have to be made for other areas also.

If the programme is meticulously planned, the semester system should improve the teaching and learning processes, and should also introduce a greater degree of validity in the examination which under the present system is rather deficient. In fact most of the evils associated with the affiliating type of University should disappear. The colleges under the changed system should become effective units of teaching."

Para (a) needs a little explanation. The Meerut University Act at the time of the introduction of the Semester and Spot Evaluations required that about half of the examiners must be from outside the University. This requirement was met by the legal fiction that paper setting was half of the examination work which went to outsiders, although in the ultimate analysis not more than 10–15 per cent of the total personnel involved in paper setting and examination of scripts were from outside. Since the arrangement brought advantage to internal teachers, no objection was taken.

The basic procedure of the system as given above stands in Meerut University. The H. P. University has benefitted from the experience of the meerut University where the semester system, though in vogue in the University Centre for Postgraduate, LL.B. and Education students, could not be implemented in the case of undergraduate classes.

Perhaps it will be advisable to indicate the exact procedure followed in the evaluation centres. Five or six persons team up for the examination of scripts of any particular class. There could be several such teams depending on the number to be examined. Each team has a leader who is known as coordinator. He has received instruction from the Head Examiner about the system of marking. He examines 10 scripts jointly with the other members of the team to set the standard. He does not examine any script independently. It is, however, his responsibility to (I) distribute scripts among the members of the team, ten at a time, (II) go through some of the answer books examined by the members of the team to see that the standard agreed upon is maintained fully and to re-examine the scripts which have either been awarded very high marks or have been rated below pass marks. In the H.P. University an additional person is associated with the team whose function is to re-total the marks on the scripts to eliminate mistakes.

In your letter your have stated that it is your understanding that at Meerut "some of the teachers have not been alone telling the students that marking at their end had been casual and that this had led to some situations". I am not surprised. In every group and in every society there will always be some who would oppose a system, however, un-impeachable it may be. It would be an appropriate question to ask this class of people, if they cannot discharge their duties honestly and conscientiously when they are watched

and supervised, would they do so in the sheltered privacy of the homes. The danger point is reached when such persons are able to beguile students into undesirable action. Fortunately, at least, this is my belief, the englightened conscience of the teaching profession will not tolerate such persons for long.

May I suggest that you ask some persons with experience to write on the events of examination at home. I am in a position to say that I know of a large number of cases in which newphews, nieces and students examine scripts on behalf of the examiner. As a Vice-Chancellor I had to deal with cases of criminal nature arising from the evils of examination at home. Let experienced persons on both sides say whether or not on-the-spot evaluation is a progressive or a retrograde step.

May your spirit to serve the cause of education increase with accelerating speed.

With regards,

Yours Sincerely,
Sd/-
R. K. Singh

Spot Evaluation of Answer-Books

M. G. GUPTA

INTRODUCTION

The most serious problem relating to the conduct of university examinations in India hinges on the management of numbers may be of candidates, examiners, invigilators, superintendents or the clerical staff. In an affiliating university, it becomes more serious than in the case of a residential university. The introduction of a mass of private candidates has added more dimensions to this already complicated problem. The uncertainty and inefficiency of the postal service and means of transport also bring in organizational difficulties. It is becoming increasingly difficult to ensure timely announcement of results. Examination offices often run a race with the clock. The traditional method of head examiners sending instructions to the deputy head examiners and the latter to their co-examiners becomes a definite handicap. Unfortunately, there is also a feeling among the students and their guardians that the examiners looking into the scripts in the seclusion of their homes do not examine them with due care. It is also contended that in some cases the complaints are made of extraneous influence. It is under these circumstances that Agra University used the system of spot-evaluation of answer-books of the combined pre-medical test in 1969. In the course of this paper, it is proposed to explain briefly the salient features of the system as it existed in 1969 with a view to throwing light on the various issues involved.

I—METHOD OF SPOT EVALUATION

The combined pre-medical test (C.P.M.T.) was conducted in 1969 at Lucknow, Kanpur, Meerut, Allahabad and Agra. The number of candidates appearing at various centres was about 25,000. Two sets of question papers were got printed in all the four subjects, viz Physics, Chemistry, Zoology and Botany. One of the sets was used and the other was kept in reserve to meet an emergent situation created by any possible

leakage of question papers. The main scripts of the question papers were handed over to the press personally by the Registrar who also took delivery of the question papers personally. Question papers were opened in the Registrar's strong room in the presence of a skeleton confidential staff attached to the Registrar, who also functioned as the Secretary to the C.P.M.T. Board. The Registrar personally filled in the question papers in the envelopes meant to be sent to different centres. The question papers were despatched through special messengers by train. A group of four messengers was sent to each centre. The groups were constituted to the heterogeneous with a view to avoiding collusion among its members. Observers were sent to various centres to watch the conduct of the test. The centres were asked to despatch the answer-books to Agra through special messengers immediately after the daily test was over. (The test lasted 4 days) The answer-books that were received were stored in a specially constructed strong room attached to the Registrar's room. There was no use of fictitious roll numbers.

Four days after all the answer-books had been received, the examiners, drawn from various universities in Uttar Pradesh on the basis of seniority lists sent to the Agra University Registrar by the Registrars of different universities were called to Agra. Four days were allotted to each subject so that the entire evaluation was completed in 16 days. The head examiner was invariably invited to issue general instructions to his co-examiners on the spot. All the examiners were to assemble at 10 a.m. at the Senate Hall.

The answer-books were carried from the strong room to the Senate Hall by illiterate peons and *malis* in the presence of the Registrar. The answer-books from any shelf could be shifted. In the Senate Hall bunldes were made, each containing 50 answer-books. The examiners were called alphabetically and were requested to take any bundle lying on the table, so that even the Registrar did not know which answer-book was being examined by whom. The Registrar along with his Deputy and Assistant Registrars was present in the Senate Hall at the time of evaluation. Press representatives and Senior Professors appointed by the Vice-Chancellor also watched the operation.

The examiners were not allowed to go out of the Senate Hall before they had completed the evaluation work. Arrangements for their food and refereshments were made as also bathroom facilities were given within the premises of the Senate Hall. If an examiner, advertently or inadvertently, moved out of the Senate Hall for any reason, the bundle originally given to him was withdrawn and a fresh bundle was given. This was done to avoid any complaint that the examiner had got in touch with interested parties outside the Senate Hall. The Senate Hall and the whole campus was under careful watch by 8 sections of the Provincial Armed Constabulary (P.A.C.) The district authorities had given massive assistance for the smooth execution of this operation.

As soon as an examiner finished his lot, he prepared the mark-sheet which was handed over to the Registrar. The tabulators were called in the strong room to tabulate the results in the Registrar's presence. The tabulation was completed in 2 days.

Perhaps an example to illustrate the meticulous care that went into the whole operation would be interesting. One day at about 1 p.m., the Registrar came down to the strong room for about 5 minutes, in connection with a problem pertaining to this test. As he came out of the strong room and started moving towards the Senate Hall, a P.A.C. officer came rushing to him and requested him to accompany him to the main gate of the University. There he pointed towards an examiner who had just come out of the Senate Hall and was talking to some candidates standing outside the gate. The Registrar found this examiner making some notes in his diary. He siezed the diary immediately and took him to the Senate Hall for personal discussion. In the diary were found several roll numbers whose answer-books this examiner had evaluated since 10 a.m. These answer-books were taken away immediately from him and were referred to the head examiner for revaluation. The head examiner reported that this examiner had shown favouritism to these candidates. The Vice-Chancellor was out of station that day and the Registrar had to take action on the spot. He debarred this examiner from the rest of evaluation and reported the case to the C.P.M.T. Board, which approved the action. This incident gave currency to the rumour that the Registrar was not only harassing the examiners but also had some ulterior motives. But that is a part of the game.

II

Having detailed the central features of the system that was used at Agra, attention may now be drawn to the major assumptions behind the introduction of spot evaluation. The first assumption is that spot evaluation provides a technically better evaluation as head examiners and other examiners are personally available for discussions. It definitely ensures uniformity of conditions under which the scripts are marked. The second assumption is that it is speedier as it eliminates the traditional system's lack of co-ordination between various examiners and avoidable postal delays. A third assumption is that spot evaluation is more just and therefore more appropriate in the present atmosphere of malpractices. Obviously all the examiners cannot be said to be dishones., as also all of them cannot be said to be honest. It is a fact that many of them do not examine the scripts with the care to which the candidates are entitled. It is again a fact that most of the examiners are rushed up for time; they have to examine thousands of answer books in the course of about one month. If these assumptions are true, and there is no reason why they should not be, there is everything in favour of spot evaluation. Sooner the univertsities replace the out-moded system of sending the answer scripts to the addresses of

examiners, the better. The author is fully convinced that the universities will do well to think seriously in favour of spot evalation of answer books.

III

It would be worthwile to point out certain difficulties involved in the operation of this system as well. The new system might appear difficult as it requires a new concept of the management of men. The traditional model of excercising tight supervision and control and demanding maximum compliance needs modification. What is needed is human relations model designed to increase morale and satisfaction by making office staff feel themselves to be a useful and important part of the overall effort. The latter model tends to view office staff as reservoirs of untapped resources which include physical skill and energy, creative ability and the capacity for responsible and self-controlled behaviour. Obviously different situations require different kinds of leadership. The Registrar as the leader of the office is engaged in controlling and co-ordinating the work of the staff, but in the new system he must be-able to make helpful suggestions and show consideration for the welfare, feel ings and conveniences of members of the staff. Since speed is the essence of spot evaluation, the staff engaged has to work day and night for about 4-6 weeks. This would call for a great deal of personal care and attntion on the part of leader. The leader must also have personal integrity, capacity for hard work and team spirit. He should be good in job allocation. If selection is unskilled or thoughtless, it may cause misuse and wastage of employable personnel. It may drive manpower into positions in which persons will not be able to utilize their talents, with the resultant frustration discouragement and dissatisfaction. Job allocation means placement and placement is the key to the whole system analysed above.

Another type of difficulty could be concretized by an actual incident about the experiment conducted at Agra University in 1969. The son of the P.A. to the Registrar and that of the senior most Deputy Registrar were appearing in the C. P. M. T. 1969. Both of them failed to qualify although their parents were associated closely with the conduct of this test. Somehow, a little before the announcement of the result suspicious minds had made written complaints to the Vice-Chancellor that these two officials had misused their positions. The Vice-Chancellor personally scruitinised the material relating to these two cases and was fully satisfied that the allegations were baseless.

On the face of it, spot evaluation is more expensive than traditional evaluation. The traditional expenditure involved in this system is caused by provision of daily allowances payable to the examiners. This is, however, more or less compensated by non-payment of fees to the deputy head examiners and head examiners, which the system of spot evaluation implies.

IV

In conclusion, it may be said that points in favour of spot evaluation far outweigh those against it. If universities do not adopt it, it must be mainly because of some basic inertia and not because of lack of funds. In some universities (Meerut for example) answer-books are evaluated on the spot at 6-7 centres. This may not be sound as it is a dilution of the system and may ultimately defeat some of its objectives. Only if answer-scripts are evaluated at one place, can we ensure coordination, speed and objectivity.

Revaluation of Scripts

G. N. TANDAN

INTRODUCTION

Revaluation of examination scripts is a recent development in the universities. Till recently the only facility available to the candidates who appeared at the university examinations, was to get their answer books scruitinized, which meant checking up the total of the marks and to see that no portion of an answer in the script is left unvalued by the examiner. Origin of revaluation may, however, be traced to the functions and powers of the Results Committee, which empowers the committee, in case it feels so, to get the answer books in any paper or subject revalued by the same examiner or by any other examiner when it finds that the result in this particular paper or subject is much too low or too high in comparison with the results of the same students in other papers of the examination.

I—NEED

A question arises as to why this facility of revaluation has been permitted by some of the universities and is being demanded by the students in other universities. There is really a host of reasons for it, obvious ones being: erratic valuation, strict valuation, indifferent valuation or even victimisation. Victimisation may be theoretically ruled out as the scripts bear only the roll numbers which are many times fictitious, but in case of residential universities or universities having smaller or local jurisdiction its possibility cannot be completely ruled out. In one of the Universities there have been a few cases particularly in a paper like Mathematics wherein the marks of the candidates who applied for revaluation were very much increased ranging from 200% to 400%. In one case a candidate who was awarded about 10 marks, got as a result of revaluation, 37 marks. The revaluation was done by two separate valuers. In such cases it is difficult to rule out the allegation of victimisation particularly when the original valuer happened to be a local examiner. Such cases, in fact , establish a bonafide claim for revaluation. Nevertheless the

most cogent reason for revaluation is the error of judgement on the part of examiners which is largely unavoidable in the valuation of essay type questions which necessarily involves an element of subjectivity. Some valuers are conservative and desire that the candidate to have not only a good knowledge of the subject matter but also a likeable expression. They expect him to put the right ideas in the right language. Some others may, however, give greater weightage to subject-matter than to expression and language. In any case the relative weightages would remain a matter of personal choice.

Accountable differences in valuation may also be discovered between valuation by a teacher in the university teaching department and that of an afiliated college. This is because of the inherent difference in the expectations of teachers in these two different academic situations. In a university teaching department there is greater access to avenues of knowledge because the university libraries are richer both in terms of reference books, recommended books, journals, research papers and also back numbers of journals etc. These are available neither to the teachers in afiliated colleges nor to the students. Hence the answers by these students are bound to be based on insufficient studies on the part of the students and restricted references on the part of the teachers. It is found in general that when scripts valued by university teachers are sent for revaluation to teachers in affiliated colleges the results are to the advantage of the candidates and vice-versa. Also that marking is biased by inter-collegiate rivalry amongst the teachers when the same subject, specially at postgraduate level, is being taught in more than one institution under the same university.

Moreover, it is no use pretending to be precise knowing fully well the margin of error. For example in the case of a single paper of 100 marks in which the minimum pass marks are say 36 the valuer may give just 34 or 35 with the result that the student may fail by 1 or 2 marks. This apperars to be rather fantastic when we know that the answers are subjective and descriptive. The intention in placing this argument is not to rule out the award of marks just below the minimum pass marks out to stress that there is definitely a strong case for reviewing at least such border line cases. It can, in no way, be proved by the examiner that the answers in the scripts deserve only 35 marks and not 35½ which would perhaps be rounded off to 36. It is at the same time an almost established fact that the same answer-book examined by the same examiner at different intervals may show alarming variation and also that the same answerbook when placed in between some other roll numbers may get a different mark.

Looking at the statistics available in the Jiwaji University, Gwalior regarding revaluation it is found that in some of the faculties like Medicine and Ayurved there are almost no applications for revaluation. But the number of applications in case of other faculties like Arts including Social Sciences, Commerce, Law, Home Science and Science is much more, though the percentage is rather insignificant from the point of view of total number of

candidates taking that examination and still more insignificant taking the total number of candidates appearing at all the examinations of the year. The number of undergraduate students who applied for revaluation of their scripts during three consecutive years 1971-73 with the percentage of these applicants in whose cases the results were altered are given in Table 6.1. It appears from the table that only in a small percentage of cases who seek revaluation does the final result deviate from the original result by 10% or more of the maximum marks. It has also been observed that most of the cases who apply for revaluation do so because they fall short of the passing mark by a small margin (less than 10% of the maximum marks) so that if there is a slight increase, the candidate becomes eligible for the award of grace marks or when he misses higher division by a few marks and he expects to get it as a result of revaluation.

TABLE 6.1

POSITION REGARDING THE REVALUATION OF SCRIPTS AT JIWAJI UNIVERSITY, GWALIOR FOR THE YEARS 1971-73

Year	*No. of Students taking examination*	*No. of applications for revaluation*	*Percentage of cases where marks were increased by less than 10%*	*Percentage of cases where marks were increased by 10% or more*	*Percentage of cases where marks were decreased by 10% or more*	*Others*
1	2	3	4	5	6	7
1971	31,971	242	39.7	8.3	0.8	51.2
1972	33,768	436	29.4	23.4	4.4	42.8
1973	33,713	599	26.4	11.5	2.7	59.4

It may also be mentioned that very few students have a fairly good assessment of their own performance at the written examination particularly when the answers are subjective and descriptive. Many of them think that marks are awarded on the basis of number of pages written. My own experience as valuer has been that in some cases the candidate does not even answer the question asked but answers something that he has prepared even when it does not appear in the question paper. Because of this subjectivity in judging the expected answer, a student sometimes expects more makrs and feels injustice has been done to him which he wants corrected through revaluation.

IID METHOD OF REVALUATION

The practices followed in most of the universities regarding revaluation are also different. (For rules of revaluation for Jiwaji University, Gwalior

and Kerala University, Trivandrum, see Appendices A and B) In some Universities the revaluation is done by a single examiner and the verdict of this examiner is taken to be final. It is, therefore, a matter of chance whether the examiner selected for revaluation, who is generally external to the university and at times also to the State, is a strict examiner, in which case the student stands to lose. But if he is a lenient examiner, the student stands to gain. Of course, when a script is sent for revaluation usually about ten answer-books valued by the same examiner having obtained different marks are also sent so that the revaluer may acquaint himself with the standard of valuation followed by the original examiner. In some universities, the script is revalued by two different examiners separately and the average of the two is awarded. Under this system, it has often been found that there is usually a variation in two examiners of more than 10% and in certain cases much more than that. Hence it cannot be concluded that the revaluation has in any way been more just than the original valuation. Yet in some universities where the script is got valued by the two examiners separately, average of all the three is awarded to the candidate (including the marks awarded by the original valuer).

Thus the mode of deciding the final mark differs from university to university. While some take the average of the first and the final evaluations, some others take the best of all the evaluations as the final mark. But there seems to be a general consensus that there can be an error of measurement upto 10% of the maximum marks. That is why some of the universities in their revaluation rules clearly specify that the advantage of revaluation will be given only when there is a change to the extent of 10% or more of the maximum marks of the paper (See Appendix B). If there are more than one revaluers, some universities stipulate the deviation to be 10% or more in all cases while others at least in one of them. Another moot point in this connection is whether only advantage should be given or the result of revaluation can operate in both directions.

III

So long as we have the system of subjective and descriptive answers and so long as we find that there could be almost as many standards of valuation by the same examiner as the maximum marks of the paper, it appears difficult to rule out the facility of revaluation. Cases of change as a result of revaluation may be minimised only when the original valuers devote much more attention to the scripts and really see that justice has been done to the candidate as far as it could be. It may be necessary for this that the burden of valuation on some examiner who are able to manage the valuation scripts from a very large number of universities has also to be controlled because most of the valuation has to be done within a defined period as main examinations in most of the universities start in March or April and the results are generally declared in June or July. Hence it is within this period of about a month, that

most of the valuation work is done. It is, therefore, very necessary that there should be a control over the number of scripts that may be allotted to each individual examiner during this period. How could this be done is a matter for consideration.

CONCLUSION

The practice of revaluation has come to stay and shall have to be adopted, sooner or latter, even by those universities that have not done so far. Something can be said in its favour also. It protects candidates from falling victim to indifferent valuation or victimisation. We have to see that it does not become a fashion with the failure cases and that at the same time justice is done. The fee prescribed should, therefore, be fairly high. The best method may be get the scripts valued by two examiners, one of whom may, if possible, be from outside the state and that the average of the three be taken as the final valuation. A portion of the fee may be returned to the candidate if the final valuation is to his advantage by more than 10% of the maximum marks in the paper.

Appendix—A

JIWAJI UNIVERSITY, GWALIOR

RULES FOR THE SCRUTINY OF MARKS AND REVALUATION APPROVED BY THE COORDINATION COMMITTEE AND PROPOSED TO BE ADOPTED FROM 1975 EXAMINATION ONWARDS.

SCRUTINY

1. Any candidate, who has appeared at an examintion conducted by the university, may apply to the Registrar for the scrutiny of his marks in the written papers in any subject and re-checking of his results. Such application must be made so as to reach the Registrar within 30 days of the publication of the results of the examination.
2. Such application must be accompanied by fee as per schedule given below:—

(a)	In one subject	.....	Rs. 8/- (Eight),
(b)	In all subjects	.....	Rs. 20/- (Twenty).

Provided that for purpose of this paragraph each paper of post-graduate examination in a subject and also LL.B., B.E., B.P.Ed., and B.Ed., examinations, shall be reckoned as a subject.

3. A candidate shall not be entitled to a refund of the fee, unless his result is affected by the scrutiny.
4. The result of the scrutiny shall be communicated to the candidate.
5. If, as a result of scrutiny, it is found that the examinee should be declared as having passed or placed in a higher division the result of the candidate shall be revised accordingly and the fee deposited by the candidate for scrutiny of marks shall be refunded to him.

REVALUATION

1. A candidate whose result has been declared may apply to the Registrar in the prescribed form within thirty days of the declaration of his result for the revaluation of any of his answer-books.

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Provided that no candidate shall be allowed to have more than two answer-books revalued.

Provided also that no revaluation shall be allowed in case of scripts of practicals, field work, sessional work, tests and thesis submitted in lieu of a paper at the examination.

2. The fee for revaluation shall be Rs. 100/- per answer book.
3. If the correct valuation arrived at as a result of revaluation exceeds the marks awarded by the original examiner the candidate shall be entitled to a refund of Rs. 60/- out of the revaluation fee deposited by him.
4. Where a candidate applied for revaluation the answer-book in which revaluation is sought will be sent for valuation by the Kulapati, to two examiners (other than the one who initially valued it) atleast one of whom shall be from a place outside the State of Madhya Pradesh.
5. If the marks awarded in the paper, by any of the two examiners, varies from the marks given by the original examiner by more than 10% of the maximum marks in the paper, the average of the marks awarded by two of the examiners—the original examiner and the two revaluers and nearest to each other—will be taken to represent the "correct valuation". This average of marks will be awarded to the candidate for the revision of his result.

Provided that subject to the condition that atleast one of the variations from the original marks is more than 10% of the maximum marks in the paper if two differences in marks allotted by the three examiners are equal, the two marks to the best advantage of the candidate shall be taken into account for arriving at the correct valuation.

Appendix—B

UNIVERSITY OF KERALA

RULES LAID DOWN FOR REVALUATION OF ANSWER BOOKS

SHORT TITLE

These rules will be known as rules for revaluation of answer books at University Examinations:

RULES

1. All candidates are eligible to apply for revaluation according to the rules.
2. Every application for revaluation should be made on plain paper by the candidate and should be accompanied by a fee of Rs. 50/- (Rs. Fifty) only per answer book.
3. Applications for revaluation should be submitted within fifteen days on receipt of the mark list or within 45 days of the publication of the results.
4. The answer books to be revalued will be sent to two different examiners for independent assessment. The examiners after revaluation will report the marks to the university confidentially.
5. While arranging for revaluation, the marks awarded originally would be defaced and the marks awarded by the revaluers would be recorded separately on sheets other than answer books.
6. If there is a difference of 10% or more (of the maximum) between the original marks and the marks given on revaluation *by both examiners,* then the average mark given by the two examiners who have revalued will be taken as the mark of the candidate and the fee for revaluation remitted by the student will then be refunded to the student.
7. If the difference is less than 10% between the original mark and the marks given by either of the examiners revaluing the paper, the original marks will stand. This rule will not apply to Post-graduate Examinations for which there is provision for double valuation and hence no provision for revaluation.

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8. The examiners assigned for revaluation will be paid remuneration according to the prescribed rates for the concerned examination subject to a minimum of Rs. 50/- (Rs. Fifty) only.
9. As far as possible, revaluation will be done at the university.
10. The examiners who are found to be guilty of gross irregularity in awarding marks for answers will be given deterrent punishment.

Question Banks in the Universities

H. S. SINGHA

With automation becoming an article of faith with scientifically minded persons, a question bank seems to be the most modern innovation in the examination procedures of the universities. But we should naturally ask: Is it just a fad to satisfy the sense of modernity? Is the question bank a panacea for most of the ills of examining? What can it really achieve or what can it fail to achieve? What are the possible levels of setting up a question bank? And how can universities go about doing it, if a decision in this regard is taken? These are important among a host of issues that need clarification so that this useful aid in examining could be exploited fully by the universities. This paper attemp.s to clarify some of them.

I—CONCEPT OF A QUESTION BANK

Meaning

What does a queston bank really mean? It may mean many things. One thing, however, is certain that whatever else a question bank may be, it is definitely a collection of questions. The differences in its various concepts, generally lie in ter.ns of the number of questions which may constitute a bank, their level of refinement, the details of item analysis data carried with the questions as also in the functions assigned to the bank. As regards the number of questions which go to make a question bank, opinions may really differ. While some may be content with having just as few as 50 questions in a subject, to others any restriction on this number is utterly abhorrent[1]. It seems easier to justify a question bank with larger number of questions than

1. The University Grants Commission in their recent plan of action for examination reform (UGC, 1973) visualize a question bank of only 50-100 questions in each course. The question bank in the National Council of Educational Research and Training, (like question banks in other countries), however, runs to a couple of thousand items.

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with fewer ones on the grounds of keeping pace with the explosion of knowledge—a conservative estimate being that knowledge is doubling itself every 10 years. Moreover recent developments in educational theory with shift of emphasis in testing, as also in teaching, requiring a large number of novel combinations of learning points necessitate a larger set of questions.

But the most important issue regarding a question bank concerns what technical information, if any, obtained through item analysis should be incorporated with the questions. The characteristics of a question like: the facility index, the discriminating power, the time required to answer it, the instructional objective on which it is based and the unit of syllabus are important for various reasons. It is widely agreed that the information about these characteristics would go a long way in predicting the functioning of a question in an actual testing situation. It would, no doubt, be arduous, time-consuming and expensive. Another difficulty about it is that item statistics vary from group to group because of different objectives, different textbooks and different teaching methods and it may be argued that there would be no value whatsoever in obtaining such statistics except for the refinement of questions to remove their ambiguity. But this difficulty is not insurmountable and, possibly, could be taken care of by making the try-out sample representative of the students for whom the questions are designed. What is, perhaps, required is a compromise between practical difficulties in getting item analysis data and the rich dividends that we expect from them in testing. In such a compromise, a question bank could have just some quantitative and qualitative information about each question like: the instructional objective and the content area on which it is based, its estimated facility level and also the estimated time required to complete it. This information can be easily obtained through a consensus of experienced teachers who would also refine the questions.

As regards the functions of a question bank, they can be as narrowly conceived as just helping the paper setters or could be as broad as a reference service for most of the things connected with the university education. Questions being the raw material for both testing and teaching, a question bank obviously has wide potentialities. Much would, of course, depend upon how it is organized.

Genesis of question banking

The idea of a question bank is neither revolutionary nor very novel. Teachers are known to have their private collections of questions which they utilize for various educational processes that they have to contend with in the course of their duties. What is perhaps new about a question bank is that it is now being thought to be organized in an institutional framework. Even such institutional collections of questions have been established in developed countries for quite some time. In India also such a question bank at the

secondary stage has been in existence for the last over 10 years.[2] The university stage, however, lagged behind the secondary stage in question banking, as perhaps in many other aspects of examination reform. This was possibly because of the lack of any organized effort like that of the National Council of Educational Research and Training at th e school stage. But now with the opening of a Research Cell in the Association of Indian Universities to organize research and development programmes in examination reform and U.G.C. taking active interest in the improvement of university examinations, the situation seems to have materially changed.

At the tertiary stage, the need for question banking was recognized as far back as January, 1971 in a Seminar on Examination Reform (IUB, 1971). This Seminar visualized a very simple mechanism for setting up a question bank in a university whereby the detailed syllabus(which would include a clear formulation of the objectives of that course) as drafted by the committee on courses was to be circulated to all teachers. They, in turn, would be invited to frame questions in relation to the syllabus. There were to be no restrictions on the number of questions that they might frame. In fact the larger the number of questions framed, the more extensive would be their participation. All the questions thus framed were expected to be sent to the university office and presented to the committee of courses at their next meeting. Obviously quite a number of these questions might be repetitive. These could be deleted. In the case of the rest, if found suitable in relation to the objectives of the syllabus already formulated and circulated, these would be put on the list of approved questions. A considerable amount of editing and classification would be required. This would be necessary so as to put everything on a systematic basis instead of having it in a haphazard manner. In other words, pre-testing of questions was an important condition which must be fulfilled before these were included in the pool.

An important aspect of this scheme was to treat it not as a once-in-a-life-time-affair. That would be to completely misunderstand the objectives of the scheme. The scheme required, as a matter of fact, that, as a part of their instruction, the teachers should keep on framing questions in collaboration with their students and that this exercise was undertaken not only once in a year but repeatedly and at intervals. Indeed some of the questions framed earlier could be rejected and new ones framed after some time. This would indicate not only a greater sense of participation on the part of teachers and students but also a deeper understanding of the subject on the part of both.

2. The National Council of Educational Research and Training have a pool of 11,000 questions in various school subjects collected from various sources and produced in specially organized Test Development Workshops. This item pool was used by a few Boards of School Education like: the Central Board of Secondary Education, Delhi and the Secondary School Certificate Examination Board, Poona to facilitate paper setting.

Most crucial to the whole scheme was the involvement of students in the formulation of questions. Teachers were accustomed to designing questions for their students as a part of their normal work. What was proposed in this scheme, however, was that students too, and in larger and larger numbers, should be associated with this task. This could be done in many ways. Teachers could formulate questions and try them on their students. Wherever necessary they could amend them in the light of students' performance and criticisms received. Alternatively students themselves might propose questions and those could be tried in the class and finally adopted for inclusion in the proposed pool of questions.

The Seminar, however, could not finally decide whether the question bank in a university should be confidential or a public property. The general consensus was that if the question bank was extensive enough and the number of questions ran to hundreds if they were supply-type (essay and short answer) and possibly thousands if they were obective type, nothing would be lost by making them public. It was also visualized that the principal responsibility for initiating and carrying out question banking would devolve upon the Committee of Courses. The key role was to be played by certain knowledgeable and forward looking people who could work on the Committee and were vested with the power of screening the very large number of questions beside laying down the syllabus and formulating the instructional objectives.

The idea of a question bank also formed an important component of the U.G.C.'s action plan for examination reform (UG.C , 1973). It was recommended in this action plan that "the boards of studies established by the universities should not only frame the syllabus, but also a "Bank" of questions for each of the courses. Questions for the Bank may be invited from teachers as well as students, and where necessary members of the boards of studies should frame the questions. In this manner each course should have a bank in which there may be 50 to 100 questions. The questions in the bank must be suitably distributed over the entire course and they should preferably be of equivalent standard. The questions may be modified or changed every year. The teachers may be given a chance to set upto 25% questions from outside the bank, particularly numerical questions".

According to the U.G.C. plan, each examining body was supposed to appoint a Board of High Level Experts. The Board, functioning throughout the year, would examine the syllabus and the duration of the question paper. It would also decide on the basis of the number of questions, the units into which the syllabus should be divided. The questions would be contributed by teachers on payment basis but would be scrutinised by the Board. It was thought that by drawing questions at random from each unit a "well designed" question paper could be obtained. The question bank was supposed to be a public property. It was argued that this would eliminate the element of chance as also the possibility of leakage of question papers. The

question bank was throught to be a "live component in the academic framework" and as such would have to be modified and revised from time to time.

From the A.I.U. Seminar to the U.G.C. Action Plan the concept of a question bank seems to have moved a step towards over-simplification. The Seminar had visualised it as an ever expanding universe of pre-tested questions involving a good deal of participation both from teachers and students. The U.G.C. Action Plan, on the other hand, restricted the questions bank in a subject to a collection of 50 to 100 questions. Moreover, according to the U.G.C. plan these questions were to be suitably distributed over the syllabus and were expected to be of equivalent standard—an almost impossible situation. The paper setting was also thought to be based entirely on the question bank which is open to both technical and pedagogical complications. The whole idea of a question bank appears to have been dangerously oversimplified. Obviously, we are asking rather too much from a question bank. By making paper setting entirely dependent on the bank, we are taking a myopic view of the whole process. In fact, this may do more harm than good. It may cripple the examination system rather than improve it. If questions are chosen from out of a set of 50 to 100 questions, examinations would be completely invalidated. It would become almost impossible for the paper setter, with his freedom drastically cut, to get a balance in the question paper in terms of both the weightage to content and instructional objectives as well as the distribution of facility level and the forms of questions. Are we not ending up in testing for the memorization of certain questions when our emphasis should really be on critical and reasoning abilities? And who can draw the boundaries to the universe of knowledge as suggested by a limit of 100 questions? In this form, the question bank becomes a crutch for the paper setters who are not academically strong but becomes a hinderance for the imaginative ones. A question bank, if it is to play an effective role in university education, should necessarily be broadly conceived, imaginatively planned and efficiently operated. We should not try to go beyond its legitimate functions. In any case it should never become the be-all-and-end all of everything in paper setting. It should remain only an aid to paper setters—to be used voluntarily.

It may also be observed that while in developed countries it is being increasingly recognized that it would be difficult to imagine a question bank developing its full potential without making use of the technical and administrative advantages of a computer (Schools Council, 1971) the concept of banking in the Indian universities did not visualize computerization as its integral part. The handling of large scale computations, the drawing of samples, the storage and retrieval of questions and related data—all of these functions argue the case for a computer.[3] It is high time that the possibilities

3. For a detailed discussion on computerization in a question bank, see "Computer in Examinations" by V. Natarajan.

of setting up a computerized question bank in one or two universities are explored.

With the setting up of a Research Cell in the A.I.U. to plan research and development programmes in examination reform, question banking in the universities can be backed up by a coordinated and organized effort. The A.I.U. has already started exploring the idea. A question bank in mathematics is being set up on a pilot basis. This would eventually be followed by similar banks in other university disciplines. The questions are being stored on specially designed item-cards which would facilitate comuterization of the bank at a later stage.

II—ADVANTAGES OF QUESTION BANKING

Because of the pivotal position questions occupy in university education, the availability of good quality questions through question banking will have an all-pervasive effect on various aspects of the educational process. Questions provide the medium through which students interact with teachers and instructional materials in the course of their learning but more than that they are the mainstay of evaluators who have to depend on them more than on anything else, particularly in the written type of testing that we have at present in the universities. Thus a question bank, by providing pre-tested and refined questions to everyone concerned with university education, acquires a versatility in educational improvement programmes.

It is very easy to see the use of a question bank in the improvement of testing. The present university papers are not only unimaginatively designed but are also replete with questions that are defective either in content or wording or both. The question bank helps in their improvement by making available to the examination offices statistically sound questions of known technical worth. It allows careful pretesting of questions from which advance information generally of a statiscal nature is also sometimes accompained by other qualitative details like the instructional objectives the question is intended to test, is given. This information is helpful in the selection of questions for a well designed balanced question paper.

Besides this primary function of improving testing in the universities, question bank has a number of incidental advantages. For example, it provides a set of good questions to teachers which they can use at various stages of their lessons like: introduction, development and reinforcement. Needless to say, a question bank helps the students as well by defining university expectations for them. It may considerably reduce the scare and anxiety caused by examinations among students. A carefully planned question bank can also be a tool for curriculum development.

The process of the production of questions also gives good dividends. It helps in identifying and clarifying instructional objectives in various disciplines—an area most neglected in university education. While guidelines

should normally come from the instructional objectives, at present most of the teaching, curriculum framing and bringing out a textbook is rather based on intution. Thus a question bank would help in setting right the balance in university education. It would help the universities to come out with explicit lists of instructional objectives illustrated with questions as otherwise they tend to be stated as broad generalizations conveying almost next to nothing.

But more than anything else, the production of questions in a question bank, if properly undertaken, can also be instrumental in the democratization of the management of university examinations. At present only a few teachers have a hand in the finalization of syllabi and question papers. By involving teachers and even students, their level of participation can be increased. This would also incidentally stimulate item writing in the universities which has, so far, been woefully neglected with the result that only a few questions remain in circulation.

A question bank also has a crucial role to play in the maintenance of educational standards in the universities. This becomes important at a time when there is a proliferation of all types of colleges. Since each question in a question bank carries with it statistical and other information, teachers in the college can compare the performance of their own students with the expected performance in the university. A question bank at the national level can similarly help in the maintenance of standards in the country as a whole by providing inter-university comparisons. Through pre-testing of items comparability procedures can be carried out concurrently rather than retrospectively as at present.

II—LEVELS OF QUESTION BANKING

The idea of a question bank in higher education, as it has evolved over the years, is still clouded in confusion. By and large, question banking has been too narrowly conceived while its role has been too widely visualized. Much could naturally depend upon the way a question bank is organized in a university. The role it can play in the improvement of testing, teaching and learning would ultimately be determined by the level at which it is established. There are clearly four levels at which question banking can be taken up by the universities. Because of the lack of better names, we shall call them Levels 0, 1, 2 and 3.

Level O:

At this level a question bank is just a library of questions. The questions do not carry with them any information concerning the facility level, the discriminating power, the time required to complete, them the instructional objectives on which they are based etc. The questions may at the most be classified according to the areas of the syllabus from which they are drawn.

In this form, a question bank does not give any additional information about questions that is not obtainable from textbooks. It may, however, give some additional question.[4] Although good in itself and it may be found quite useful by students, teachers and textbook authors, its utility for the improvement of testing seems to be rather limited.

Level 1:

At this level a question bank becomes a collection of questions, each one of them carrying with it certain qualitative and quantitative details in the form of "guess estimates". The questions are not, however, pre-tested or item analysed. Only such details as can be easily arrived, at through a consensus of experienced teachers and subject matter experts, like: the estimated facility level, the estimated time required to answer them, objectives on which they are based etc. are given. Obviously, at this level in addition to its utility for teachers and students, a question bank becomes a better tool for testing. With the help of technical information about questions, it is possible to forecast, to some extent, the performance of questions in the examination. It is definitely an improvement over level zero but still it does not go far because the indices are after all only estimated ones. But this is perhaps the minimum that a question bank must have if it is to be an aid for paper setting, besides being of help to teachers and learners in the universities. There is, of course, an additional advantage of setting up a question bank at this level in that the universities will not have to encounter many organizational difficulties.

Level 2:

At this level the question bank becomes a sophisticated collection of pre-tested and pre-judged questions classiffied by the content and the instructional objectives that they test and carrying with them item analysis data like: the facility index, discrimination index and popularity index of questions. The questions are rigorously tried out and calibrated possibly against the university standards. As the item analysis data are empirically obtained, it is possible to predict the performance of questions in the examination very accurately. Naturally, therefore, at this level the question bank becomes a very efficient tool for the improvement of testing. It facilitates test construction so much that once the design of the question paper has been prepared, the final question paper becomes a mere matter of compilation from the question bank.

Level 3:

This is only an extension of Level 2 with the difference that the questions with their statistical and other details are stored in a computer facilitating

4. Some may even doubt whether at this level it is a question bank at all. That is why, it is being called the zero level of question banking.

their retrieval and manipulation. This really represents the acme of question banking, taking paper setting to almost an automatic level.

It is easy to see some broad relationships between the levels at which a question bank in a university is set up and the functions it can serve on the one hand as also with the organizational and financial difficulties that are likely to come up in the way on the other. It appears, that, as we go higher in the level, the complexity of question banking increases adding thereby to the organizational difficulties as well as to the cost of setting it up. But perhaps the dividends which the universities can reap from question banks also increase with increasing complexity. It may naturally, be difficult to find out the point of optimization of a question bank in a university in this regard. Anyhow, the level at which a question bank is to be organized is an important issue that a university will have to decide before venturing upon it. The choice perhaps lies between Level 1 and Level 2. Level O fails to give anything more than scanty assistance to testing and has therefore to be discarded. Level 3 is rather too sophisticated to be coped with in the present circumstances and can only be taken up on an experimental basis. As Level 3 is based on Level 2, it may be appropriate to plan the question bank initially at Level 1 or 2 making provision for its ultimate extension to Level 3.

IV—STAGES IN QUESTION BANKING

Once the role of a question bank is properly conceived and the level at which it is to be set up decided it would not be difficult to establish it. If it is planned at Level 1 or 2, the following could be the possible stages for its establishment.

Collection of question

The first step in question banking is clearly the collection of questions. Questions can be collected from various sourcesl ike good textbooks, question papers from different universities and the question banks in other universities as also the central question bank.

Production of question

Such a collection of questions may not take care of the whole gamut in a discipline. The gaps would have to be located and filled by production of new questions. This may be done by organizing test development workshops or by inviting questions form the teache. s and the students. It is through this production of questions that teachers and students can have a feeling of participation in the management of university examinations. As mentioned earlier, it also helps in indentification and clarification of instructional objectives in different subjects.

Screening of questions

The questions collected and produced will have to be screened. This may be done by specially constituted Screening Committees in different subjects or even by the existing Boards of Studies. If the question bank is to be set up at Level 1, the Screening Committee/Board of Studies will also have to decide for each question its estimated facility level, estimated time required to complete it as also the instructional objective on which it is considered to be based. Screening Committee would also be responsible for editing the question so as to remove ambiguities in their wording.

Try-out of questions

If the question bank is planned at Level 2, the questions after passing through screening will have to undergo a rigorous try-out on a representative sample of students. This would help in refining the questions and also yield statistical indices which could be used for predicting the functioning of the questions in the examinations. The estimated indices arrived at during the screening of questions would now be replaced by actual item analysis data.

Storage

The questions that are finally selected and refined would need to be stored scientifically. This may be done on item cards giving all the possible information about the questions. These item cards should be so designed that they lend to computerization to facilitate extension to Level 3.

Dissemination

We have already discussed the issue whether a question bank should be confidential or should be a public property. By keeping it confidential we shall only be cutting out some of its legitimate functions. If the question bank is really set up on an extensive scale we do not lose anything by making it public except that some of the novel testing situations may become familar and routine. This problem could, however, be overcome by constant replenishment. It appears, therefore, that if we are to get maximum benefit out of a question bank it should preferably be printed in the form of a brochure and circulated to teachers and students.

Replenishment and revision

Question banking in the universities should be an on-going process. New questions should be added to it and the dead wood removed from it from time to time, preferably every year. If new situations are added to the question bank every year we shall be adding to knowledge and also ensuring that there are sufficient unfamiliar situations for the purposes of testing.

V—CONCLUSION

In the end it may be remarked that although the idea of a question bank is not new, it has seldom been seriously taken up by the universities. It has undoubtedly the potentiality of improving university examinations. It can improve instruction in the univesities. But to top it all, it can be a vechicle for the maintenance of educational standards in the universities. It may, however, be reiterated that a question bank should not be planned in isolation. It should be an essential part of the academic life in a university. A question bank in a university, therefore, brings in some other corollaries with it. It may necessitate the setting up of a Research Cell/Academic Wing in the examination office charged with the responsibility of maintaining, revising and circulating the question bank. Moreover it would be highly inconsistent to try traditional paper setting with modern techniques. The university will have to appropriately modify its procedures of paper setting to get maximum benefit out of a question bank.

The right place for a question bank is obviously the university itself. Idealy every university should have its own question bank according to its requirements. Initially however question banks may be established subject wise—one university taking up question banking in mathematics, another in history and so on. The question banks would, of course, be available to all universities that may like to use them. In addition to these question banks in the universities, there exists a strong case in favour of setting up a question bank at the central level as is being planned by the A.I.U. This central bank, besides acting as a bank of banks and a trend setter in the beginning, can also take up coordination and clearing house functions for the question banks in the universities.

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Computer in Examinations

V. NATARAJAN

Never before has there been such a serious and earnest commitment to the cause of education. Education is to-day a primary concern of a majority of Indians. Concern, however, is not enough; it must lead to progress and improvement throughout our educational system. Of all the "explosions" we have heard about in recent years, one of the most exciting and of profound concern to educators is the "knowledge explosion". The world has acquired more knowledge expecially in science in the last twenty years than in the last twenty centuries. Nonetheless, many schools, colleges and institutions are trying to teach an expanding curriculum in a traditional manner and in the traditional amount of time. Students go to schools and colleges for about six hours a day, six days a week and forty weeks a year just as they did one hundred years ago. Only at the tertiary level, changes have taken place and we have innovations like semester system being tried out here and there. Looking close to what happens in a classroom (be it a school or a college), great number of students sit together and are expected to learn the same things because they are nearly of the same age and exposed to the same information. A glorious assumption is that every student is just the same as any other. The students are, accordingly, processed through simultaneously even though an end evaluation proves, beyond doubt, that they are all different. Individual instruction for special needs is not available.

New developments in educational technology provide the proverbial ray of hope. For example, the computer has vast potentialities not only as a research tool but also for innovating teaching and learning process. In our country, its presence in the university has however been justified initially by its importance for research—first in engineering and the physical sciences but increasingly in other areas. As a secondary function, it has become valuable in university administrative data processing. It is seldom thought of, as an aid for instruction. Even in countries like the USA where computers are widely in use, only very recently it has come to be considered a part of the pedagogical equipment. Its usefulness as a teaching aid has been discovered almost by chance and its potential in this area is just now beginning to be recognized. Computer can make a unique contribution to the teaching process, that of

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allowing the student to solve by numerical methods, problems which are too advanced for him to work with, by analytic means and bringing to him insights that are difficult to attain in any other setting. During a conference[1], a select group ofeducators, educational administrators, technologists and others engaged in the pursuit of educational innovation was actively involved developing recommendations for research and development in six areas of computer application to education—environmental control, testing and evaluation, curriculum planning, gathering and retrieval of data on the cumulative experience of education, information sources for the individualization of instruction and student subject matter interface. This paper aims at discussing the various ways in which the computer can support test construction, isolating the potentials of computers in analysis, design and data processing of examinations, resulting in increased accuracy, speed and economy—with particular reference to what can be done immediately with the available computer facilities in our country.

I—COMPUTER IN INSTRUCTION

It is difficult, if not impossible, to consider "computer in examinations" in isolation from "computer in educaton" or "computer in teaching and learning". In educationally developed countries, the computer had been used for student record keeping, examination marking and analysis and of late, question banking. It is only in the last decade that the use of computer to individualize instruction, to aid instruction and to support the process of teaching and learning has come about. Suppes & Atkinson of Stanford University developed computer programmes for teaching, reading, mathematics and logic at the elementary school level and used them successfully. There has been a wide variety of Computer Assisted Instruction (CAI) in use now in USA and UK and there has been a debate about the value of cmputers in education in respect of its cost, distribution, reliability, ease of use, relevance to educational purpose, richness of instructional experience, effectiveness relative to alternative procedures. Most of the questions concern cost and efficiency. It goes without saying that a computer system allows a better representation of the real world to be simulated in the laboratory, and permits laboratory control and measurement to be taken out into the real world.

II—COMPUTER IN TEST CONSTRUCTION

The computer can really be an asset in university examinations. There are two aspects of educational assessment where a computer can be widely used: (1) assistance in the preparation of tests, and exercises serving different

1. The Conference was organized in November 1965 by the Association of Education Data Systems and Stanford School of Education.

purposes, and (2) processing of examination data, treatment of scores and item analysis.

Assistance in the preparation of tests and excercises is a recently emerging use of computers that has had very little publicity but which shows signs of widespread appeal. Computer assistance may involve any combination of the following activities:—

1. Questions may be *banked* by a computer and subsequently retrieved individually to print tests and excercises;
2. Question may be *classified* according to content and statistical characteristics so that tests meeting carefully defined specifications can be constructed automatically; and
3. The items or questions may be *generated* by the computer.

The author is aware of more than four dozen different computer based test construction systems, and undoubtedly there are many more. One is likely to be struck by their diversity. Systems having similar test preparation functions often were developed for different reasons. Systems which were motivated by similar considerations often support somewhat different functions. Some systems restrict themselves to the support of test preparation: others offer test preparation as one of several related services such as test scoring. While most systems are designed to support evaluation or diagnosis, some also provide lists of questions for drill or review or for self evaluation. Most computer assisted test preparations takes place in post-secondary institutions; some deal with postgraduate certification of medical practioners. Others support testing in the military services. There is a commercial computer based test construction service. USA leads in exploring this field. Similar activities are under way in Britain, Canada, Germany and Australia. The author is not aware of any development in India where, of course, there is a tremendous potential available.

Question banking

In most test construction systems using the computer, questions are stored in manipulable form so that the test itself can be easily printed. Data banks of machine-readable questions are developed. There are atleast 100 item collections now in use in USA. They vary in size from a few hundred questions to a many thousand questions with the median size slightly over 1000 questions. Popular subject matter areas among institutions of higher learning are the behavioural sciences, medicine, engineering, and business administration. At school level, subjects like mathematics, social studies, science and (with less emphasis) languages are banked.

The UGC in a recent document "Examination reform—A plan of action" (U.G.C.,) 1973) circulated to all Indian universities, has suggested to build "Question Banks" in subjects and use them as a part of reforming examinations. A dozen universities selected to implement these on a trial

basis, are on the way to create question banks for their various examinations. The author is assisting one of these universities to build up banks for their degree examinations. The item/question card is designed in such a way that it will be possible to computer-store questions easily. Text-line length, provisions for classification and the scheme to identify individual items to name only a few are some of the elements in design However, it is the author's considered opinion that there should be an immedate attempt to standardize format and share existing item collections and to go a step further, a coordinated attempt must be made to produce questions by different universities. A genuine difficulty in question storage in computer is that line drawings, sketches, pictures etc. are very difficulty to store and these will have to wait until high fidelity computer storage and printing of analogue data is economically feasible. Eventhough some item authors have exercised remarkable ingenuity (e. g. creating follow-the-number puzzles so that the examinee can pencil in a curve) in respect of line drawings and shaded pictures, usually these are separately available. Most of the computer assisted question banking deal with multiple choice questions while a few deal with more subjective ones as well.

Eventhough it is not possible for anyone exposed to different computer systems to recommend one for use in our country, it will not be difficult to make a few suggestions in the light of possible advantages that will accrue from centrally coordinated and severally applied systems at a few selected universities and institutions that have computer facilities. Institutions of national importance, unitary universities, I. I. T.'s, regional colleges and other specialist institutions that have degree awarding status and have computer facilities can develop their own systems. Other universities and institutions can then borrow these systems for their use. It may also be desirable to have a central coordinating unit (sponsored by UGC or AIU) say National Centre for Computer Aided Test-Construction to lay down norms, standardise formats for computer storage, retireval and test construction and to organize training of personnel. This National Centre will have :

1. Coordinating function to coordinate the efforts of different centres in universities and institutions having computer assisted testing systems;
2. Supervisory and training function to train a body of personnel in the area of Computer Assisted Testing (CAT);
3. Research function to carry an on-going research into the effectiveness of CAT; and
4. Information dissemination function.

III—COMPUTER IN ANALYSIS OF TEST RESULTS

In USA due to flourishing computer industry and the early adoption of objective testing techniques by national examining bodies, the introduction

of automated procedures for the processing of test data for our-stripped developments in Britain where there is a continuing dependence upon more subjective approaches to university examining. In India also since dependence on subjective approaches is dominant, there is a widespread lack of familiarity among educators and teachers with the techniques of automated test scoring and item analysis. The basic role of the computer in this context has been the provision and speeding up of tabulation and caluclation procedures for the reporting of the candidate's scores and for the derivation of test and item data.[2] The use of computers to mark candidates answers, declare results, provide item analysis in respect of facility value and discrimination index, treat examination scores and provide feedback information about the behaviour of individual questions is increasingly felt and it would be ideal to combine this with the potential of computer in storing banks of questions for purposes of test construction. Automatic processing can provide much more information than is normally available through manual test and item analyses. Item statistics require a considerable expenditure of time under normal conditions and the rapid provision of these together with standardized or normalized scores provides comparative and diagnostic data that have not been previously in the hands of teachers.

There are different ways of using computer in the analysis of examination results. The author is aware of certain systems adopted by examining boards wherein, each student's marks in different subjects are transferred on to the computer by punched cards and the computer declares pass/fail, obtains the total, average, etc. Details like standard deviations in different subjects are not, however, obtained. The possible advantages may be in terms of dealing with huge numbers of students, elimination of human error in declaration and data processing. But there is no guarantee against complete elimination of error since human effort is extended, in any case, upto punched card input.

If multiple choice questions alone are used, it is possible to use computer to mark student's answers, arrange them in rank order, calculate mean, standard deviation, standard error, item facility value, item discriminating power and reliability coefficient of the entire test more effectively. The author has written a programme in Fortran II language and used it for examinations given to teacher trainess. Williamson (1973) has a similar programme in Fortran IV with the addition of histogram of students' scores as a part of the output. The output will include individual scores of students, count of choices, ranked scores (Z scores as well), facility values and discrimination indices, and a histogram of students' scores.

It is possible to treat examination scores in different subjects (with different means and standard deviations) by converting them to standard

2. A fuller discussion is given in 'Use of mechanical aids in examination work' by J. M. Mehta and R. P. Soni.

scores with a common mean of 50 and a common standard deviation of 10. This procedure will help to: (a) render marks obtained in different subjects by an individual capable of being added together since the standard scores are on the same scale; and (b) remove anomalies resulting from differences in levels of difficulty of examination papers, and differences in standards of marking by different examiners. The author has developed a computer programme in Fortran II to help conversion of raw scores into standard scores. The author and Prof. Jambulingam have analysed the scores (raw) of candidates in the diploma examinations of the states in the Southern Region and, based on this study, have suggested to the AICTE national norms for the award of first class.

Most of our universities are operating on a combination of internal assessment and external examinations. The desirability of having the internal assessment and external examination results entered separately has been sufficiently established; but still some universities may think it necessary to combine the two. Of the many ways of doing it, Amrik Singh's method (1973) in relative ranking in internal and external assessment is, according to the author, simple and more logical. This can be computerised as well. K. P. Bora (1973) has come out with one method of scaling of marks for diverse standard of examinations. The linear transformation of marks by the suggested procedure also lends itself to computerization and the scaled marks (combined score) can be obtained through the computer.

In conclusion, it may be said that the computer offers tremendous potential and if it is used to analyse examination results and treat scores, a wealth of information will be generated. This will, surely, go a long way to put examination reforms into practice.

IV—COMPUTER IN RESEARCH IN EXAMINATIONS

The use of computer in research in examinations need not be over emphasized. Examinations is an under-researched area and there are many aspects that can be probed through studies and investigations. They range from fundamental research studies in the evaluation system, comparative studies of different types of examinations, validity and reliability analyses, design of continuous internal assessment, aptitude tests, attitudinal scales etc., to ongoing research in diagnostic, achievement and prediction levels of examinations. Quite a bit of research into scaling, grading procedures, more rational pass/fail criteria, optional questions and objective type testing need to be conducted in India. The results obtained as a result of ongoing research would be very vital in introducing meaningful reforms in examination system. The research function of the proposed National Centre for Computer Aided Test Construction must periodically suggest fundamental and ongoing research problems for the various centres in the universities.

The Centre must also periodically publish the results of such studies and make them available to all concerned.

V POSSIBILITIES IN INDIA

The UGC document "Examination reform—A plan of action" (UGC., 1973) while mentioning the impediments to reform, says: "There are vested interests. The various examination Boards together have a vast machinery, they probably spend crores and thus distribute favours. Many University teachers may be earning a month's extra salary from remuneration. Those who are senior and have more voice in academic decision making, may be earning much more than this" (p. 2). Eventhough it is difficult to say how much money is actually spent in the conduct of examinations at various levels in university education, one can safely assume that it must be a huge amount. The examinations at a particular level of one university do not differ very much in content and type from the other. If question banking is accepted and one step further if tests are stored and retrieved from computers (one at every university/institution), there can be considerable amount of saving in the long run. In addition to this, a lot of information can be gathered and questions can be refined on the basis of behaviour or relevance of these items. Valid and reliable examinations can be made and teachers offering different courses can be expected to make a couple of sets of examination papers out of the stored questions in the computer as a part of their job without having to pay a lot of money for paper setting. In a similar way, computer marking can be resorted to in the case of multiple choice part of examination papers and it will not be difficult to organize central marking of the more subjective part of the examinations by various teachers (again as a part of their duty) and results fed into the computer. As a first step, universities may start developing question banks, storing them on computers for certain of their courses and make comparative studies on the feasibility and effectiveness in terms of cost, accuracy etc.

It is reported that some of the systems operating computers for test construction, analysis etc. are more economical. John Menne (Iowa State University) reports that in the Iowa State University system, a typical cost figure for the computer time for retrieving the items and producing the master copy of 70 items 8 page test on the white bond is 75 cents. Julian Salisrijak (Rochester Institute of Technology) reports that items are stored on a disk pack (IBM 360/40) with the original input provided from punched cards (data cards). The system can handle multiple choice, true-false, short answer fill-in, matching and enhanced questions. (Drawings, diagrams etc. have to be supplied separately.) Subjects like economics, money and banking, marketing, management, social science, psychology, sociology, computer science etc. can be dealt with. Question bank is protected from abuse by physical restriction of access to the disk pack and the programmes. In

addition all the programmes that permit access to the stored material are further protected by a secret code word known only to authorized persons. In terms of faculty time the system results in very significant savings. It takes one about 25 minutes to prepare a 75 questions multiple choice economics examination of approximately 15 pages (actually 30 pages since a second from of the test with questions arranged in a different sequence is prepared at the same time). This may take otherwise for a secretary nearly a week or so to get things ready. With the system, the turn-round time has been cut to 24 hours. Of no little value is the fact that once the stored data have been properly proof read, there will be no errors or omissions to make an otherwise good question useless.

In terms of cost, computer assisted test preparations seem to be competitive with traditional methods. There are of course two kinds of costs in involved: keypunching of data card and computer time for data storage which are fixed costs that should be amortized over the lifetime of the data bank. The rental cost of the disk pack is aslo a fixed cost, to be prorated among the users and then there is the variable cost of producing tests and other printouts. Rental cost may be Rs. 1000/- per year. It will take about 30 minutes to store 10,000 data cards. For variable costs actual use matters and in an academic year, something like 30 tests involving about 1 hour of computer time to retrieve may cost Rs. 100/- or so. Finally there is one other benefit: the great help it provides in the prevention of student absues during the taking of tests. Since it is easy to prepare a new test, there is never a need to use the same test again and it is easy to have variations of same questions (e.g. choices arranged in different order). As for copying of answers from neighbours under crowded classroom/or examination conditions the use of two or more test forms with the same questions but in different sequence will eliminate it for all practical purposes.

The cost of creating question banks in different subjects will have to be tied in if the overall economy is to be studied. The dozen universities that are selected by UGC may go about building question banks in a coordinated way each being responsible for one or two subjects at any one level and finance these projects themselves and later share the question banks themselves. It is better, and in fact necessary, for a country like ours where resources are very difficult to find, that a coordinated attempt to question banking is immediately started. It is the considered opinion of the author that if such a coordination is built in at the start of he project, it will be possible to produce the necessary materials at minimum cost.

As regards accuracy, the input material must be proof read carefully and if there are no errors at this stage, there will be no error at all. Some people argue that the computer can be erratic in terms of its output. It is again the opinion of the author that if the in put format is not too complicated and liable to errors, the output cannot be erratic.

To those familiar with the evolutionary growth of computer use in other areas of human endeavour, assistance with test preparation should come as no surprise. Assisting humans by taking over routine operations is typical of the way in which the computer has first entered in most fields. In fact, only as computer users have become more acquainted with what is (and what is not) possible and after many years of experience with routine operations, has the machine usually been assigned more complex decision making tasks. When compared to many other uses of computers in support of instruction, the economic advantage of test construction becomes apparent immediately. The cost of operating a system which supports construction of tests that are to be administered at a later time can be very low. It is not necessary for each student to occupy an expensivee quipment, such as a computer terminal. It is not even necessary for the test constructor to have access to a terminal when he requests and receives service: very small computer can also be used.

Benefits

Some of the important uses of a computer in examinations may be summarized as:

1. Systems which print tests have the obvious advantages of reducing the clerical chores of users and providing error-free text.
2. Systems which also aid in item selection make questions conveniently available without the need for users to tediously search item text or item characteristics.
3. A tester can produce tests carefully tailored to meet instructional needs as he defines them.
4. When large numbers of questions become available the problem test security practically disappears.
5. No single test need be protected after it has been administered.
6. Students can keep their examination for further study.
7. Make-up tests can be constructed easily.
8. Tests can be administered frequently as instructional tools.
9. If desired, a different test can be prepared for each student.
10. Perhaps the most significant benefits to be realized by those who use the computer to retrieve questions stem from the fact that the items reside in a centralized collection. When many users share such an item collection, all of the advantages of specialization are realizable. Users can have access to each other's questions.
11. Item quality can be improved efficiently as feedback from many users is taken into account by specialists responsible for maintaining the collection. The existence of a centralized bank, properly modified as a result of experience eventually results in high quality items.

Degree of sophistication

While it is possible to construct very simple systems which operate at very low cost, it is also possible to implement better and more sophisticated approaches, if desired. Some systems permit a test request at a point and receipt of the test at a remote terminal. A test constructor can interact conversationally with his item bank. There are systems that administer tests to students directly via terminals. Many have computer scoring services associated with them. The correct answers for tests produced may be stored; consequently answer keys need not be submitted with input to scoring. Item statistics which aid in test preparation may be accumulated directly during scoring. A scoring report can be produced for each student directing him to specific sources for remedial study.

The fact that the systems operating in educationally developed countries were usually stimulated by class room teachers rather than professional innovators experienced in applying computer technology to education, indicates that they satisfy the needs of educators. The fact that they are seldom supported by special innovative funds suggests that the value to cost ratio is satisfactory. This, according to the author, will inspire the use of computer in test construction and slowly extend to computer assisted or computer managed instruction in our country.

VI—USING EXISTING COMPUTER FACILITIES

There are over hundred universities and other institutions of higher learning in India. It is also estimated that about 100 computers are available with them. It is possible that with the establishment of a National Centre for Computer Aided Test Construction under the auspices of the UGC or the Association of Indian Universities and a centre at every university having computer facilities, a national programme can be chalked out and implemented. As a first step, a survey of existing computer facilities may be conducted and data collected.

The National Centre then may initiate the activities through its different units having different functions to perform. A suggested pattern is shown below

NATIONAL CENTRE FOR COMPUTER AIDED TEST CONSTRUCTION

Coordinating Unit	Supervisory Or Training Unit	Research Unit	Information Dissemination Unit
1. Design Computer Assisted Test Construction Systems.	1. Supervise question banking projects for use in computers.	1. Conduct ongoing and fundamental research into systems of CATC.	1. Collect information from other units.
2. Coordinate activities of centres.	2. Train personnel in the use of computers in test construction.	2. Advise the centres on research problems.	2. Disseminate through bulletins and publications.
3. Help to create bank of questions and store in computers.			
4. Arrange to exchange these among the units.			

The dozen universities that are on their way to build question banks may try to store them in computers and use computers for test construction and data processing of examination results and make available all the data regarding the trials to other universities for guidance

VII—CONCLUSIONS

In conclusion it may be said that either the UGC or preferably the AIU must initiate setting up the National Centre for Computer Aided Test Construction as detailed above. A survey of existing computer resources in various universities/institutions may be conducted and a number of centres established to try computer assisted test construction. The National Centre, after laying down norms and standard formats may then invite personnel from various centres and train them in CATC. A beginning must be made and this certainly will add a new dimension to examinations in higher education.

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Use of Mechanical Aids in Examination Work

J. M. MEHTA and R. P. SONI

I—INTRODUCTION

Some of the problems arising in connection with university examinations and their results can be effectively tackled by using mechanical aids. Indeed, the use of mechanical aids will not only minimize human errors but will also ensure speed, neatness and secrecy.

The Gujarat University, which is an affiliating as well as a teaching University—affiliating at undergraduate level and teaching at post-graduate level—has been using such mechanical aids as are suitable in its work relating to examinations since 1962. With mounting enrolment[1] it had been becoming increasingly difficult year after year to tabulate results manually without allowing errors to creep in. The time-pressure too had its effect on the implementation of checking routines meant for detecting the possible errors. As such the use of the unit record machines was considered to be the only solution to cope with the demands arising out of: (1) the increasing number of candidates, (2) introduction of the system of internal evaluation and (3) the time available for the preparation of results of various examinations. With this view, the University consulted the system advisers of the I.C.T. Ltd., and initially hired the following unit record equipment[2] suitable for mechanisation in the year 1962.

1. *Punching machines* for taking information of the examinees on to the punch cards in the form of punched holes. The traditional hand punch machine can give an output of 80 to 100 cards per hour.

1. In 1973 the number of candidates appearing at its various examinations from more than 150 affiliated colleges and recognised institutions of the Gujarat University was above 95,000 (exclusive of the Matriculation or the S.S.C. Examination which is conducted by the S.S.C. E. Board and is not conducted by the University).
2. Similar machines can also be hired from the I.B.M. (International Business Machines) Corporation.

2. *Verifying machines* for removing any error committed by the punch operator. The output of this machine is also between 80 to 100 cards per hour if the cards are punched by a good operator.
3. *Sorters* for rearranging the sequence and merging the separate files of cards. A medium speed machine can sort at the rate of 600 cards per minute.
4. *Tabulator or Accounting machine* for listing on paper the information punched on the cards. The machine can add, subtract, select, crossfoot and print the totals in any required manner. A good accounting machine can work at a speed of 150 cards per minute.
5. *Reproducing punch* for transferring partial information from one file of cards to another. It is also useful for comparing information located on two separate files. The most pertinent use of this machine is punching automatically a new deck of cards with summary information (or totals) developed by the accounting machine, when interconnected externally by an electric cable.

In the initial stages the mechanical aids were employed for:-

1. Pre-examinations jobs like (a) preparation of subjectwise and centrewise numerical statements; and (b) preparation of roll numbers of candidates;
2. Post-examination jobs comprising tabulation of marks and preparation of result sheets;
3. Post-result jobs such as the preparation of marks-sheets and collegewise copies of the result for each examination;
4. Various numerical statements regarding percentage of results—subjectwise and centrewise, rank etc.

For this purpose, it was found necessary to create a separate 'data processing' cell in the University Office, headed by a Superintendent under the Examination Department. Some of the members of the staff of the University were given elementary training for 2 to 3 months in the use of these machines. At present all examination processing work is done on the I.B.M. Machines in the newly set up department called University Computer Centre.

II— THE SYSTEM IN BRIEF

The entire system of processing can be divided into three phases depending upon the characteristics of the data to be utilised, time-pressure and secrecy required. These phases are: (1) Pre-examination jobs, (2) Post-examination jobs and (3) Post-result jobs. Different operations which are handled with the help of mechanical aids in the Gujarat University during these phases are described in the following paragraphs.

As a first step towards the use of mechanical aids it was, however, necessary to redesign the form of application for admission to the examination. This form is required to be filled in by each candidate. The form was

so designed that all the necessary particulars regarding the candidate and his college, subjects offered by him, centre for examination, whether repeater or fresh, subjects in which exemption in claimed, male or female etc. can be read at a glance. A system of 'Numerical Code' for each datum was evolved keeping in view the 80 column punch card. In the application form the numerical code for each datum has to be filled in by the college in which the candidate has studied during the year. In order to guide and simplify the work of college office, a booklet giving the numerical codes for different examinations and subject-combinations was prepared and supplied to the colleges (A specimen copy of codes for Pre-university Arts examination is given in Appendix A). These forms duly filled in for an examination are required to be submitted to the University office by the colleges at least 8 to 10 weeks before the date of the commencement of the examination.

When the forms duly filled in as stated above are received, each form is carefully scrutinised in the Examination Office both with respect to the examination particulars and the numerical codes shown therein, and any missing information or mistake detected in respect of subjects, exemptions claimed etc. are corrected. The forms are then sent to the Data Processing Section. The process of checking the forms is time consuming and the output per hour of an individual or a pair of clerks doing this checking work varies with the details needed for an examination. For example, in Pre-University Arts examination at the Gujarat University, a candidate has to offer 7 subjects out of total of 25, some of them compulsory and some voluntary. In this case, on an average a pair of clerks can only check about 40 forms per hour. In case of checking the forms of candidates who are repeaters, the time required is even more than that for fresh candidates. Nevertheless, estimating at this rate it takes 5 pairs of clerks about 9 days (5½ hours each) to check thoroughly 10,000 forms of a single examination, say Pre-university Arts. For preparing centrewise statement arranging the candidates alphebatically keeping in view the subject combination offered by them, and checking may need 7 days for 5 pairs of clerks. Typing and cyclostyling or printing the same takes one more week. The process of preparing centre-wise lists, when carried on unit record machines, however, needs only 4 persons and 2 days and ensures accuracy and clarity in the statements.

Pre-examination work on machines

In the Data Processing Section the pre-examination work begins with the receipt of duly checked application forms. Cards (A specimen of an 80-column card designed for Pre-university Arts Examination is given in Appendix B) are punched on the basis of the information contained therein and are verified on semi-electric machines. This creates the deck of card 'one' for each examination. The information punched on this card is of a non-variable i.e. permanent nature comprising examination, candidates'

full name, father's name, surname, college, subject-group, sex etc. Then follows the sorting of the cards on automatic sorter machines according to the alpha of the name of the candidates, examinationwise. The second field to be sorted in the subject-group; the third field sorts out the mode of appearance (whether in whole or in part or A.T.K.T. or under any other ordinance) and finally the centres at which the candidates desire to be examined are sorted out. This process on machine takes considerably less time and gives primary data i.e., number of students at a centre, number of candidates in various subjects etc. The cards are then listed on the accounting machine, and the lists are checked for any possible error which might have crept in either at the punching stage or during the sorting process. To this order of cards sequential numbers are assigned, and the following statistical statements and documents are produced on the accounting machine attached with a reproducing punch and the summary cards obtained thereform.

1. *Centre tabulation* giving the roll numbers of candidates in various subject-groups at different centres, giving clear picture of the number and the subjects offered by candidates at a centre for a particular examination;
2. *Subject-statements* giving subjectwise roll numbers of candidates of all centres and the mode of combination of different subjects, so essential for the planning of the time table and the requirement of the number of copies of the question papers in each subject at various centres.
3. *Exemption-statements* showing roll numbers of candidates claiming exemption subjectwise. The statement is very important at the last examination stage where the absentees are to be thoroughly checked, as very often the examiners, despite being instructed, put 'absent' against the roll number of a candidate who has not appeared in the subject on account of his claiming exemption in that subject.
4. *Candidates' lists*: The deck of card 'one' which has seat-numbers assigned on it (punched automatically on a reproducing punch) is passed through the accounting machine and the stencils are also cut simultaneously on it, which can be used for cyclostyling as many copies as required. The time taken for cutting stencils for an examination of 10,000 candidates is about 3 hours only for normal operation. This saves enormous labour and time otherwise taken for typing or for proof-reading and printing the rolls in the press. It has resulted in substantial economy in expenditure also. Copies of these rolls are sent to centres and are also displayed on the University notice board.
5. *Internal evaluation sheets*: The deck of card 'one' is sorted collegewise leaving the previous sequence unaltered. Necessary information i.e.

the name of the college and seat number, name, subject-group etc., of the candidate is printed in duplicate on blank internal evaluation sheets by passing the deck of card 'one' through the accounting machine collegewise. Both the copies are sent to the respective colleges for entering the internal assessment marks for each subject against each candidate in an examination. Colleges are given detailed instructions as to how to fill in these sheets for various subject-combinations. This has been found convenient as the college can rectify any discrepancy between the subject actually studied at the college and the subject as mentioned by the candidate in the application form. This helps the University office in avoiding any last minute trouble arising in the examination hall in respect of the number of copies of question papers at a centre or a student claiming a question paper in a subject other than the one shown in the candidate's list along with subject combination.

The college retains one copy for their record and displays it on the notice board for the information of their students and sends the other copy with subjectwise internal marks neatly typed therein to the University Office. These sheets are passed on to the Data Processing Section, where a card deck called card 'four' is created with partial constant information from the deck of card 'one', the order being kept collegewise. The data of these internal sheets are transferred to appropriate columns in card 'four'. They are listed on the accounting machine and checked up with original entries with a view to removing any error that might have possibly crept in during punching and verification process. Corrections are made wherever necessary and the deck is then filed for use on the computer in the post-examintion phase.

This completes the pre-examination work. The Data Processing Section has then about one and a half weeks' time at its disposal before the markesheets of University examinations are received. During this time it engages the machines for creating the deck of card 'three' with partial constant information from card 'one'. They are sorted out seat numberwise and filed. As the system was gradually developed to suit the limitations and facilities of the various machines installed, the present day system does not use the card 'two' which was formerly required for extending the information punched on card deck 'one'.

6. *Hall tickets:* During the pre-examination phase, the use of the card deck 'one', however, enables the system to be further extended without any difficulty to issuing the admission cards or hall tickets to the examinees. These tickets cover the spelling of the examinee's

name, his optional subjects, examination centre, subject combination code, name of the college etc.

Post-examination work

After the examination is over the marks awarded by the examiners are processed as follows:

1. *University examination marks:* Final mark-sheets from the Charimen/Moderators and Examiners come in the prescribed printed forms. They are instructed to write legibly. These final mark-sheets are passed on intact to the Data Processing Section. The lists of exemptions and the absentees shown therein are thoroughly checked. The totals are also checked by comptists on comptometers.

   Thereafter marks for each subject are punched seat numberwise in the appropriate fields on the card deck 'three'. They are also verified before listing them on the accounting machine and are manually compared with original entries made by respective examiners. In this comparing process errors are almost completely eliminated and the card deck 'three' is kept ready for further processing.

   The totalling of marks of two sections of a paper or totalling of marks of more than one paper in a subject can also be done by the accounting machine. The mistakes occurring due to mental fatigue where totals are manually made can thus be reduced to zero, with much saving of time and without any mental strain to an individual worker.

2. *Analysis of result:* The card deck 'three' containing records of university examinations and deck 'four' containing records of college examinations are merged seat numberwise on the sorter machine. Prior to this process, it is ensured that the partial constant information on cards 'three' and 'four' are exactly identical for each candidate by running these cards on a reproducing punch, putting a comparing check.

   The cards 'three' and 'four' merged together, alongwith their pre-leaders and process-oriented control cards are then taken over to the I.B.M. 1620 computer. For each examination a computer programme covering all the rules to be applied while deciding the result in different situations, and putting checks to detect all possible mistakes that can be anticipated through experience is prepared in advance in a language acceptable to the computer. Preparing the programmes is a slightly strenuous and time-consuming job, but this is well compensated by the gain in accuracy and speed. The programmes are, it must be added here, prepared during lean periods by competent experienced programmers.

The computer when loaded with the programme and the cards 'three' and 'four' as mentioned above, decides the result of each candidate on the basis of the marks punched on these cards. Along with the decided result, punched on a duplicate card 'three', it also gives simultaneously other cards containing seat numbers of appropriate class for the purpose of press declaration. At the end of the run, it gives various statistical schedules punched on cards. With a good programme, the time taken by the computer for determining the result of a candidate is less than a second, and hence processing an examination of 10,000 candidates hardly takes three hours on this computer with practically no mistakes. This process, if done manually, may ordinarily take 4 days for a group of 5 persons working for 6 to 8 hours a day.

For the purposes of publication of results, cards are passed in the accounting machine, and stencils are cut on it. Necessary number of copies are taken out therefrom for distribution to various institutions and newspapers.

Post result jobs

In the meantime, different decks of cards are sorted out and merged together. Marks-statements along with passing certificates are printed by running these cards in the accounting machine immediately after the result is out. Thus marks-statements can be given to the candidates within a couple of days from the publication of result. One more run is necessary to print out office registers. This complete deck is sorted collegewise, and then, run again on the accounting machine, which prints copies of the results to be supplied to colleges. Many other schedules or lists are also printed as and when needed from the same cards.

It may be noted that when copies are to be prepared manually for each college, there are chances of wrong entries, or slips of pen. Also neatness can not be maintained as there will be many erasures. It is also time consuming. All these possibilities of mistakes and delay are eliminated by the use of machines.

Thus, the result processing task is accomplished in a minimum of time, in many cases within only two weeks from receiving of marks. Processing of more than one examination can possibly be done simultaneously.

The following data are also available immediately:

(i) List of absentees collegewise: This list is needed by the university for the refund of certain amount of examination fees;

(ii) List of successful candidates in a specified format to prepare degree certificates;

(iii) List of successful candidates with earned credit marks to be taken into consideration while deciding the class at the degree examination;

(iv) List of candidates whose results have been withheld.
(v) Various statistical schedules according to centres, according to colleges and according to males, females, etc.
(vii) List of candidates, in order of merit, subject-wise or centre-wise in order to decide prizes or medals or scholarships.

III—MECHANICAL VS TRADITIONAL PROCESSING

The following are among the more distinct advantages of computerisation of examination work:

1. The result-processing can be handled in a very short time giving most accurate outputs.
2. The cost per candidate is very low compared to manual processing.
3. The candidates' list (Rolls) can be prepared by cutting stencils on machine, thus eliminating enormous labour of proof reading and printing in the press and this brings about economy.
4. Results can also be prepared on fictitious roll numbers with the same ease and little extra time.
5. Various statistical schedules and printing of marks-statements, passing certificates, office registers, college copies, etc. can be had immediately after the declaration of the result.
6. The marks-statements can be distributed to the candidates within a day or two of the declaration of the results.
7. The result can be put on stencil papers from which enough copies can be taken out.
8. Utmost secrecy can be maintained as no individual knows about the result before it goes to the press.
9. All possible errors are rectified in time leaving practically no effect on the candidates' results.
10. The time spent for determining the result on computer is less than a second per-candidate, bringing down the total time of processing considerably.
11. It is easy to expand or to revise the system if any change is made in the rules regarding the examination or in the standard of passing, or in the number of subjects or papers at an examination.
12. A sequence of fictitious roll numbers can also be evolved and the results can be prepared against those numbers so that adequate secrecy can be ensured.

Over and above these advantages in the examination work, the installation of machines is useful in other administrative fields too. After proper planning of examination result schedules, the time on machine can conveniently be spared so as to enable the establishment to take up work in other areas like stock accounting, press labour accounting, salary bills, financial

accounting, etc. The annual cost of maintaining a Data Processing Section is thus compensated by using machines for such other work.

In order to get a clear picture, we may compare the mechanical and the traditional processing of examination work in respect of: speed, accuracy and economy.

1. *Speed:* For this purpose consider only the post-examination phase. For an examination with 10,000 candidates it is estimated that roughly 8 people working 6 hours a day would take a total of three months time for publishing results and preparing college records, marksheets and supplying them. Through mechanical processing just two persons can accomplish this task in 10 days. They would need the assistance of four punch operators for about 6 days.
2. *Accuracy:* It is an established fact that an experienced individual while doing 1,000 calculations is liable to commit at least 5 mistakes. In the mechanical processing if proper checks are incorporated in the system, the output can be claimed to be cent percent correct provided the incoming data is clear and foolproof.
3. *Economy:* There are two schools of thoughts as far as economy of machine processing is concerned. But one thing is certain that the speed gained and accuracy and neatness achieved will offset whatever little marginal increase in cost might be there in the initial stages. However, in a properly planned system, the cost can be minimized by employing the machines to tackle the hitherto untouched areas with the resultant improvement in the through put of the system.

IV—SUGGESTIONS FOR INTRODUCING MECHANICAL PROCESSING

From the foregoing it becomes clear that where voluminous data and repetitive decisions are involved, at the same time where accuracy and secrecy are predominant, and reduction of human errors and intervention is desired, the objectives can be very well achieved with planned utilization of data processing equipment. The following are a few suggestions for the guidance of universities which may desire to opt for mechanical aids in their examination work.

1. The manufacturing companies of unit record machines, after making a preliminary feasibility study, generally advise regarding the equipment that may be installed, the complete system through which the jobs may be carried on the machines and the volume of work that may be mechanized. It would be desirable to contact such organizations as have reputation in this field regarding the

feasibility of the introduction of mechanical processing of examination work.

2. During the process of introduction of mechanical aids, the internal staff having good educational background and inclination towards machine work may be trained by the supplier organisation or by other educational institutes who have already mechanized their work on similar lines.
3. In the early stages of mechanisation the old manual process needs to be continued along with the mechanised system for quite some time. Once the efficiency in the mechanised system is achieved the old system may be completely scrapped.
4. The introduction of mechanical aids will prove really helpful if the system is adopted by a university in gradual stages. A heuristic but planned approach to this will surely produce longterm benefits.

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Operation Pass Marks

Operation Passmark

H. J. TAYLOR

I—INTRODUCTION

The Matriculation examination has been conducted by the University of Gauhati since 1948. The scale of the examination has expanded from year to year, as shown in Table 10.1, and the number of candidates now (i.e. in 1963) exceeds 35,000.[1] The examination is conducted in many centres distributed over the state, including NEFA, Nagaland, and Manipur, but not Tripura. Many areas are remote, with inadequate communications. The administrative difficulties in conducting the examination are therefore considerable.

The administrative difficulties have been felt in the Matriculation and other examinations of the University. In consequence, the results are often delayed. The results of the Matriculation, Intermediate, and Degree examinations have sometimes not been available until August, or even September. This delay shortens the effective academic year, and causes a serious loss of time. This has been one of the chief grounds of criticism directed at the examination system of the University.

The Matriculation examination has also been exposed to another criticism. There is a widespread conviction that the results are very unreliable. The failure rate is large, and there is much to suggest that the examination does not necessarily select the best candidates. Up to the present there has been no way of testing the validity of this criticism, but the results have certainly not commanded the confidence of either the teachers or the general public.

A third criticism has received very little attention, but is perhaps the most fundamental. It is that the methods used for combining marks and determining results are statistically unsound. The methods used have never been explicitly adopted by the University, but were taken over from the parent

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1. Including supplementary candidates not shown in Table 1.

University, Calcutta. Head examiners are appointed to control the standard of marking, but effective control is not in fact achieved. One the other hand new uncertainties are introduced, and the final pass list may depart widely from the true order of merit.

TABLE 10.1

GROWTH OF THE MATRICULATION EXAMINATION

Year	*No. of Candidates*	*Passed*	*Pass %*	*No. of Centres*
1948	4,703	2,435	51.8	20
1949	6,016	3,040	50.5	23
1950	8,138	3,486	42.8	23
1915	7,751	3,388	42.4	23
1952	8,475	4,265	50.3	23
1953	9,416	4,606	48.9	23
1954	11,095	5,174	46.6	23
1955	12,672	5,536	43.7	23
1956	14,138	6,046	42.8	24
1957	16,792	7,742	46.1	24
1958	18,788	9,097	48.9	24
1959	21,867	9,128	41.7	24
1960	23,321	10,043	43.1	27
1961	26,738	12,004	44.9	28
1962	29,454	11,278	38.2	29
1963	33,571	17,029	50.7	31

The Academic Council of the University, at its meeting on 31-10-62, recognised that some reform of the examination system was needed. The time was opportune, since the question of examination reform had already become a subject of great concern throughout the country. A special Examinations Committee was therefore appointed to consider and where necessary revise organisational and technical matters relating to examination procedure .

The Examinations Committee took a bold and imaginative view of the needs of the situation, agreed that substantial changes were needed, and took steps to put them into effect. These changes did not affect the design and general pattern of the examination, but were chiefly concerned with the administrative methods and with the combination and evaluation of the numerical results. The aim was to secure greater efficiency in the conduct of the examination, and greater validity for the final results.

II—SUMMARY OF PROCEDURE

Before discussing the modified methods in detail it will be convenient to summarise the procedure adopted:

(i) Individual examination forms were abolished. Instead, each school submitted a consolidated list of its candidates.

(ii) The area was divided into seven administrative zones, with approximately 5,000 candidates each. An experienced Zonal Officer was appointed for each zone.

(iii) A block of some 5000 roll numbers was reserved for each zone. The University office alloted these numbers to the candidates in random order.

(iv) The Headmasters entered the roll numbers in the Admit Cards, and issued these cards to the candidates.

(v) The former practice of giving roll numbers indicating the kind of candidate (e. g. F—Female, P—Private) or the examination centre (e. g. JOR—Jorhat) was abandoned entirely. All scripts were therefore anonymous and carried only the random roll numbers.

(vi) Scripts from the examination centres were sent to the zonal headquarters by the most rapid means available. There, they were arranged in numerical order and divided into bundles for the examiners.

(vii) To avoid delay in transit, examiners were required to collect their scripts from zonal headquarters, and to return them there after marking. Basic travel costs were paid.

(viii) Scrutiny (i.e. checking the marks on the scripts against the mark sheets) was done at zonal headquarters under the direction of the zonal officers.

(ix) Mark sheets were sent to the University, and subsequent work was done by persons of the standing of lecturers specially appointed.

(x) A frequency distribution of the marks was plotted for each mark sheet, from which the median mark was determined.

(xi) The marks were then scaled, where necessary to a new median, chosen as the average value for all examiners in a zone for each paper. Specially prepared scaling tables were used.

(xii) The scaled marks were then entered in the tabulation registers, the tabulators working in pairs for mutual checking.

(xiii) On the basis of sample results, the Standing Committee of the Academic Council decided whether any allowances were necessary adjusting standards.

(xiv) Doubtful cases were decided by reference to the candidate's passing probability, rather than by the award of arbitrary grace marks.

III – THE ABOLITION OF FORMS

The use of individual examinations form is convenient when the number of candidates is small. When numbers are large the method becomes very cumbersome. Gauhati is not one of the bigger universities, by 1962 the annual intake of forms was over 50,000. Most of these are redundant documents,

since most of the information is already on record. For an examination, it is sufficient to know the identity of the candidate and the subjects he offers, and it must be certified that he is eligible under the rules. This information is most easily furnished in the shape of a single consolidated list, showing the names of the candidates and the other particulars in appropriate columns. A single signature of the Headmaster or Principal certifies the whole list. The number of pieces of paper to be handled by the University office is thus greatly reduced.

For the Matriculation examination the Headmasters submitted the consolidated lists in triplicate, prepared on printed sheets supplied by the university. In the event it was found that many schools prepared their lists very carelessly, which necessitated a good deal of re-typing in the University office. This complexity was not foreseen, and might have caused serious delay. The difficulty can doubtless be avoided in future if clearer and more specific instructions are issued to Headmasters.

The printed sheets were provided with a column for the roll numbers. These were filled in by the University office, after which one of the three copies was returned to the schools. The Headmasters entered the roll numbers on the Admit Cards which were issued to the candidates. Private candidates were required to register through the schools, and they received their Admit Cards in the same way as regular candidates.

IV—DECENTRALISATION

Many delays in the past have undoubtedly been caused by the saturation of facilities. Three lakhs of scripts have to be sorted and made into bundles, and sent to over 1200 examiners. After being returned the scripts must be checked by an army of scrutinisers, after which it has been customary to follow an elaborate procedure involving the re-assessment of sample scripts by Head Examiners. One centre, with limited accomodation and staff, cannot cope with all this work quickly and efficiently.

Seven zones were therefore established: Gauhati A, Gauhati B, Nowgong, Jorhat, Dibrugarh, Imphal and Silchar. Each examination centre was assigned to the most appropriate zone, to ensure that transport problems were minimised (even so they were formidable in some areas). The zonal officer had an office, usually in one of the local colleges, and a small staff of helpers. His main duties were (a) to supervise the arrangements at the examination centres; (b) to receive the answer scripts, arrange them serially, and distribute them to examiners (the list of examiners was supplied by the University); (c) to receive the marked scripts, and have them scrutinised by responsible persons; (d) to correct any errors revealed by the scrutiny, and arrange for the marking of any unexamined answers or scripts; (e) to transmit the mark sheets to the University. In these operations all unnecessary delays were to be avoided.

The system as a whole worked well. The examination began on April 1st and continued to April 13th. The first mark sheets reached the University by April 29th, and the last before the end of May, by which time analysis and scaling were also completed. The results should have been ready by the middle of June, but the printing of tabulation registers caused some delay. The results were finally published on June 27th, at least a month earlier than usual.

V—RANDOM ROLL NUMBERS

It was decided at an early stage to randomise the scripts given to examiners. One obvious reason is security. In the past, examiners have always known where their scripts came from, since the roll numbers of the candidates included the name of the centre. Conversely it has never been difficult for a candidate to find out who was likely to examine his script. This opens the door to the possibility of influence being exerted in favour of particular candidates or particular schools. This may happen at any stage, since the identity of the candidates is not effectively concealed. To what extent corrupt practices occur it is not possible to say, but they ware widely alleged, and it seemed wise to adopt a process which would make them virtually impossible.

The second reason is more fundamental the present report will show, examiners mark on very different standards. One examiner gives 40 where another would have given 20. These large differences between the marks of different examiners were very obvious in previous examinations, but there was no means of knowing whether they reflected differences in the standard of examining or differences in the quality of the scripts. There are good schools and poor schools, and one examiner's scripts may be very much better than those of another. When the scripts are thoroughly mixed, each examiner gets a sample representative of the whole area, and all the bundles are statistically equivalent. Any differences now found in the level of marking can be safely attributed to the examiners and not to the candidates. It is then possible to scale all marks to the same norm, which means that the performance of all candidates is measured on the same scale. No examination can be valid if this condition is not satisfied.

The following three ways have been suggested for randomising scripts: (a) To re-number the scripts and remove the original numbers; (b) To give a mixed assortment of scripts to each examiner/instead of a set in numerical order; (c) To give roll numbers in random order and to arrange the scripts serially for examining. Of these methods, (a) was considered to complex and liable to error, and was not considered further. Method (b) has certain disadvantages, but is being tried in other examinations. Method (c) was adopted for the Matriculation examination, the numbers being separately randomised for each zone.

It is convenient to speak of random roll numbers, but it is neither necessary nor desirable that they should be absolutely random in the strict statistical

sense. In a purely random order (obtained, perhaps, by drawing the numbers out of a hat) there would be no means of checking mistakes,such as duplications or omissions, except by a laborious search through the whole list. It is also desirable that each bundle of scripts shall be fairly representative of all parts of the zone. What is needed is that each bundle shall be a well-mixed set, but in distributing the numbers there must be a certain method in the madness, to ensure that the numbers can be readily traced. To achieve these ends, the following method of distributing roll numbers was adopted:

A block of numbers slightly in excess of the number of candidates was assigned to each zone, each block being a multiple of 25. Thus the numbers 1 to 4800 were assigned to zone I, the numbers 4801 to 9225 to zone II, and so on.

The numbers were distributed by writing them consecutively, in diagonal order, on a printed rectangular grid. This is illustrated by a miniature example in Fig. 10.1, which shows a grid of five rows and eleven colums in which 55 numbers are written. The rule is to proceed from the top left hand corner and fill the successive cells diagonally, reversing direction at the boundaries and jumping overcells already occupied. When the sequence termintaes at a corner of the grid a new start must be made from a vacant corner. When this sequence also ends, the next start is made from the first vacant space in column 1. The method can easily be worked out from Fig. 10.1.

FIGURE 10.1

GRID FOR DISTRIBUTING ROLL NUMBERS

A 1	B 30	C 24	D 45	E 16	F 50	G 27	H 54	J 9	K 38	L 20
A 29	B 2	C 31	D 17	E 44	F 15	G 51	H 8	J 37	K 10	L 39
A 25	B 46	C 3	D 32	E 23	F 43	G 7	H 36	J 21	K 40	L 11
A 47	B 18	C 49	D 4	E 33	F 6	G 35	H 14	J 41	K 12	L 53
A 19	B 48	C 26	D 55	E 5	F 34	G 22	H 42	J 13	K 52	L 28

In practice printed grids were used, with 25 rows and 24 columns to the page. By proceeding consecutively from page to page as if the grid were continuous, any block of numbers could be accomodated. The numbers 21801 to 27250 for example required 218 columns. After filling the grid, each column provides 25 well-mixed numbers representative of the whole block. On each sheet of the consolidated lists of candidates there werealso 25 names. The numbers written in the grid were then transferrd, column by column, to the sheets.

Each column of the printed grids had a capital letter, printed in each cell, as shown in Fig. 10.1. The numbers were issued to the candidates with

the prefixed letter, e.g. D. 13792, K. 29661. Although no numbers were duplicated the letter served as a check in case of errors. Amongst many thousands of candidates there would doubtless be occasional mistakes in writing roll numbers, but as 25 consecutive candidates from a given school would all have the same letter it was unlikely that the letter also be wrongly written. If subsequently two candidates were found with numbers, say, J 1473 and W 1473, it would be very easy to check that only J 1473 occured in the grid. The error would therefore be in the second number, and each could be made for some missing W number, perhaps W 4173, with which it could be identified.

To make seating plans for candidates whose numbers were not in serial order presented some problems, which were successfully solved. On the conclusion of each paper the scripts were sent as quickly as possible to zonal headquarters. They were then arranged in numerical order before dividing into bundles for the examiners. The randomisation ensured that each bundle, though numbered in sequence, was a thoroughly mixed sample representative of the whole zone. In most cases between 250 and 300 scripts were sent to each examiner, who was allowed twenty days for marking. The examiners returned their scripts with the mark sheets, to zonal headquarters, and the scripts were then scrutinised to detect errors in addition, unmarked answers, and similar errors. The mark sheets were then sent to the University. All these operations went smoothly, and call for no special comment.

VI—THE ANALYSIS OF MARK SHEETS

Mark-sheet analysis is a new technique which has not previously been employed in University examinations. A grahical method was adopted and for each mark-sheet, the frequency distribution of the marks was plotted. The method will be clear from the examples reproduced as Figs. 10.2 to 10.10. An 'x' against any number on the vertical scale represents a script with that mark. Thus Fig. 10.4A shows a mark sheet in which the mark 36 is awarded 5 times, the mark 40 ten times, and so on. The plotting of one of these graphs takes in practice between ten and twenty minutes.

If all the marks on the sheet are taken in order of magnitude, beginning with the highest and ending with the lowest, the middle mark is the median.

It is easily found from the graph, by counting from the top or bottom. The median divides the group of marks into an upper and lower half, with the same number of entries in each. In the same way the upper quartile is the middle mark in the top half, and the lower quartile is the middle mark in the bottom half. These values were recorded on each graph at the time of plotting.

The median is a measure of the standard of marking. It is the mark which the examiner gives to a script of average merit. Alternatively, instead of the

median, the arithmetic mean of all the marks on the sheet could be taken as the measure of the marking standard. In practice, however, unless the distribution is extremely abnormal, the mean and the median differ only slightly, and it is immaterial which is used. The graphical method has one important advantage. If there are errors in the plotting, the value ofthe median is not likely to be affected. Moreover, from the graph, features of the mark-distribution can be seen at a glance which in a purely arithmetical analysis would not be revealed at all.

In each zone, for each paper, there were approximately 5,000 scripts distributed amongst some 20 examiners. In each bundle of 250 randomised scripts the average merit will be very nearly the same. The median mark should therefore be nearly the same for all examiners. Noting that the standard deviation of the original marks is of the order of 10, a simple calculation shows that it is unlikely that the highest and lowest medians will differ by as much as two marks. If the difference exceeds three marks it is highly improbable that it could arise from sampling errors. In practice we find very much larger differences, which can only be ascribed to the different standards adopted by the various examiners.

The range of variation of the median, for each subject and zone, is shown in Table 10.2. Each entry gives the highest and the lowest median, the difference, and the number of examiners involved. For the purpose of this table the two major languages, Assamese and Bengali, have been combined. In zone D comparable data for Major Indian Language and Sanskrit are not available, since the candidates usually offer alternative subjects.

Table 10.2 shows that the variability of standards is a phenomenon which occurs in all subjects and in all zones. The smallest range observed is 8 marks, and the largest 34 marks. The average range of variation, over all subjects and zones, is 16.7. There is nothing to suggest that the range of variation is significantly less for some subjects than for others.

The variability of standards may be displayed even more strikingly if we calculate the pass percentage on each mark sheet, which is readily obtained from the corresponding graph. Quite a small change in the median may involve a substantial change in the pass percentage, expecially with the median is not far from the pass mark. The pass percentages in each subject and zones are shown in Table 10.3, where the first figure of each pair denotes the highest pass percentage recorded, and the second figure the lowest.

When looked at in terms of pass percentages, the difference between examiners appear quite spectacular. Table 10.3 shows the range of variation in the pass percentage is never less than 26 and may be as much as 85. The average range of variation, over all subjects and zones, is 46.2.

In each subject and zone the performance of the various examiners is distributed between the upper and lower limits shown in Tables 10.2 and 10.3 To which examiner a particular script goes is entirely a matter of chance.

TABLE 10.2

RANGE OF VARIATION OF MEDIAN MARKS

Subject	*Zone A*			*Zone B*			*Zone C*			*Zone D*			*Zone E*			*Zone F*			*Zone G*			*Average range for subject overthe whole State*
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
English I	(23)	41/27	14	(20)	40/24	16	(24)	39/22	17	(22)	38/24	14	(20)	36/15	21	(15)	37/22	15	(19)	37/27	10	15.3
English II	(21)	42/22	20	(20)	38/25	13	(24)	39/21	18	(17)	38/4	34	(21)	46/18	28	(14)	38/22	16	(19)	40/24	16	20.7
English III	(22)	32/17	15	(22)	38/21	17	(23)	36/14	22	(19)	36/20	16	(20)	32/18	14	(14)	35/13	22	(19)	37/20	17	17.6
Mathematics	(17)	27/25	12	(18)	41/25	16	(20)	46/19	27	(14)	39/22	17	(17)	37/20	17	(14)	36/25	11	(17)	40/25	15	16.4
History	(18)	48/31	17	(21)	47/31	16	(24)	50/30	20	(12)	36/24	12	(20)	44/30	14	(14)	50/30	20	(19)	44/30	14	16.1
Geography	(20)	39/30	9	(21)	58/27	31	(25)	45/21	24	(18)	39/23	16	(21)	43/30	13	(14)	42/28	14	(19)	42/30	12	17.0
El Science	(11)	38/24	14	(11)	46/24	22	(15)	38/14	24	(12)	38/16	22	(10)	38/17	21	(7)	32/18	14	(5)	43/24	19	19.4
Major Indian Language I	(21)	48/36	12	(24)	57/36	21	(18)	52/31	21				(18)	51/34	17	(13)	50/31	19	(18)	50/36	14	17.3
Major Indian Language II	(20)	50/34	16	(22)	47/31	16	(19)	43/32	11				(18)	46/32	14	(13)	53/36	17	(18)	45/36	9	13.8
Sanskrit II	(18)	44/30	14	(15)	38/30	8	(20)	36/22	14				(16)	39/24	15	(11)	36/21	15	(11)	39/31	8	12.3
Av. range for Zones	14.3			17.6			19.8			18.7			17.4			16.3			13.4			Overall average 16.7

Columns I, II, III in each Zone are respectively number of examiners, highest median/lowest median and range of medians

TABLE 10.3

RANGE OF VARIATION IN PASS PERCENTAGES

Subjects	*Zone A*			*Zone B*			*Zone C*			*Zone D*			*Zone E*			*Zone F*			*Zone G*			*Av. range for subjects over the whole state*
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
English I	(23)	74/22	52	(20)	73/24	49	(24)	69/22	47	(22)	60/21	39	(20)	60/6	54	(15)	61/16	45	(19)	63/26	37	46.1
English II	(21)	79/14	65	(20)	69/25	44	(24)	77/18	59	(17)	60/2	58	(21)	96/11	85	(14)	65/19	46	(19)	80/15	65	60.3
English III	(22)	43/12	31	(22)	65/8	57	(23)	51/8	43	(19)	51/16	35	(20)	40/2	38	(14)	50/3	47	(19)	61/14	47	42.6
Mathematics	(17)	72/41	31	(18)	83/42	41	(20)	77/27	50	(14)	74/36	38	(17)	73/23	50	(14)	68/41	27	(17)	78/40	38	39.3
History	(18)	99/69	30	(21)	100/52	48	(24)	98/60	38	(12)	83/38	45	(20)	94/58	36	(14)	98/52	46	(19)	96/51	45	41.1
Geography	(20)	94/61	33	(21)	95/47	48	(25)	95/45	50	(18)	81/36	45	(21)	90/51	39	(14)	94/49	45	(19)	98/60	38	42.6
El. Science	(11)	81/33	48	(11)	92/42	50	(15)	70/15	55	(12)	73/24	49	(10)	61/26	35	(7)	61/25	36	(5)	87/40	47	45.7
Major Indian Language I	(21)	97/55	42	(24)	99/45	54	(18)	91/41	50				(18)	96/46	50	(13)	98/34	64	(18)	95/62	33	48.8
Major Indian Language II	(20)	98/49	49	(22)	97/34	63	(19)	79/41	38				(18)	93/39	54	(13)	99/46	53	(18)	90/58	32	48.2
Sanskrit	(18)	93/56	37	(15)	89/53	36	(20)	85/32	53				(16)	83/16	67	(11)	91/23	68	(11)	88/62	26	47.8
Av. range for Zones	41.8			49.0			48.3			44.1			50.8			47.7			40.8			Overall average 46.2

Columns I, II & III in each Zone are respectively number of examiners, highest percentage/lowest percentage, and range of percentages

Even a very good candidate may fail if he is unlucky in this respect, since there are examiners who fail as many as 98% of their candidates. Conversely a very poor candidate may pass if his script goes to an examiner who passes nearly everybody. It may be broadly true that extremely good candidates are likely to pass, and very bad ones likely to fail, in spite of these variations, but for the great majority of candidates, of more or less average merit, it is clear that the element of chance dominates the whole situation.

It is necessary to emphasise that the analysis of the mark sheets does not imply any criticism of the examiners. The variations shown in Tables 2 and 3 often provoke the comment that the examiners are either incompetent or unreliable, but there is no evidence to justify this conclusion. Similar studies of examiners' marks have been carried out for many years,[2] and have included the marks of many experienced University examiners and Heads of departments. Large differences are invariably found even when marking instructions are prepared and circulated. All the available evidence goes to show that we have here an intrinsic feature of essay-type examination marking. Some examiners tend to be generous in their marking and others more severe, but there is nothing to suggest that an examiner's standard of marking bears much relation to his learning, experience, or seniority. In the present instance we have no reason to suppose that the mark sheets are not the work of perfectly competent and conscientious examiners. But, like other examiners, they differ widely in their standards of marking, and this fact must be recognised. The differences are inherent in the situation and we cannot ignore them; and they are so large that they invalidate the whole result of the examination. The only proper course is to measure these differences and apply the necessary corrections.

VII—MARK SCALING

By scaling is meant the adjustment of marks to a common standard. It has long been recognised as a necessary procedure, for examination results mean little or nothing when candidate A is judged on one standard and candidate B on another. The university Grants Commission, in its Report on Examination Reform[3] (p.33 and p.42) has laid emphasis on the necessity of scaling Previously it has not been possible to scale marks to a common standard, as the scripts were not randomised. After randomisation it can be done with a high degree of confidence.

Mark sheets differ not only in the value of the median, but also in the 'spread of the marks'. Some sets of marks are closely concentrated around the median, and others extend over a wide range. An exceptionally large difference of this kind is shown in Fig. 10.8. The 'spread' is measured by the standrd

2. For a further discussion on the subject see Author's "The marks of examiners". Appendix XI in University Grants Commission: *Report on Examination Reform*; 1962.

deviation of the marks, which is approximately three-quarters of the inter-quartile range. Ideally marks should be scaled so that all sets of marks have (a) the same mean or median, and (b) the same standard deviation. Of these (b) presents the more difficult problem, which needs further study before a solution can be applied with confidence. In the present work only median scaling has been carried out, but this ensures that at least the major errors arising from the variation of standards are removed.

In scaling, the marks are raised or lowered until the median comes to value chosen as the norm. There are many possible ways of doing this, which differ in points of detail but give very similar results in practice. In the method used the marks 100 and 0 at the ends of the scale are kept fixed, since these presumably represent perfection on the one hand and a blank paper on the other. If the median 30 is raised to 36, all the marks between 0 and 30 are raised proportionately, so that 10 becomes 12 and 20 becomes 24. Above the median the same principle applies. If 30 increases by 6 and 100 remains fixed, the intermediate marks change in proportion. Thus 65, which is half way between 30 and 100, increases by 3 to 68. To carry out this scaling rapidly and accurately printed tables are used[3], which give the scaled marks in terms of the raw marks for any given change of median.

If there were such a person as an ideal standard examiner, his median could be accepted as a norm to which the other marks could be scaled. There is no way of identifying such an examiner, and in practice the nearest approach to a standard examiner is the average of a large number of examiners. The average of all the medians, for a given subject and zone, is thus the most appropriate norm to use. When the marks are scaled to that norm we are, in effect, judging each candidate on the consensus of opinion of 20 examiners, instead of on the possibly erratic opinion of a signle examiner.

In scaling, certain technical points have to be considered. If the norm were obtained as the mean of several hundred examiners, its value would be known with high precision. In practice, the number of examiners is about 20, and sometimes less, and it is necessary to take into account not only the numerical value of the norm, but also its standard error. Indeed the norm may be regarded rather as a range of possible values than as a precisely known point, a range extending over two standard deviations on each side. If a median falls within this range it could be argued that there is no compelling reason for scaling in either direction. As a working rule, therefore, marks with medians falling within the above range are left untouched; those outside the range are scaled into it. Moreover, in scaling downwards, the rule adopted has been to scale no further than is compelled by the evidence. The marks are not necessarily scaled to the norm, but to the nearest point within the admissible range.

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3. University of Gauhati: *Scaling Tables for Examination Marks.*

In deciding to scale only when the evidence is compelling, and in doing so to give the benefit of any doubt in the value of the norm, we are not being guided entirely by mathematical considerations. But examining is a human problem as well as a mathematical problem, the principle of "giving the benefit of the doubt" has perhaps something to be said for it, especially when we have taken the trouble to ascertain how much doubt is involved. It means, in effect, that we think it desirable to reduce the chance of a good student failing, even though this increases the chance of a bad student passing. The principle is debatable, but it has been accepted in the present work within the limits indicated above. It has the advantage that the number of mark sheets to be scaled is greatly reduced, since only the eccentric ones need to be scaled. In practice about 45% of the mark sheets are scaled.

VIII - THE J-EFFECT

A prominent feature of many mark sheets has been called the 'J-effect', since it often gives a J-shaped distribution. In these mark sheets a disproportionate number of scripts are placed exactly at the pass mark, and there is a corresponding gap in the marks immediately below. About two-thirds of the mark sheets show the J-effect to a greater or less extent, and it can be seen in many of the distributions reproduced in Figs. 10.2 to 10.8. Fig. 10.9A gives an example in which there is a complete cut-off at the pass mark, and Fig. 10.10 shows the most extreme example found, in which 39% of the marks are at the pass-line.

The J-effect arises when the examiner considers it his function to decide whether the candidate passes or not. Recognising, perhaps rightly, that his marks are affected by uncertainties, he gives the benefit of the doubt to the candidates whose marks are just below the line. These are then raised to the pass mark, and a gap is left in the distribution. Often the gap covers only one or two marks, but there are instances in which it is as large as 10.

In adjusting border-line cases the examiner is actuated by a perfectly sound motive. The inherent uncertainties of marking make adjustments necessary, but here it is being done at the wrong stage. It is essential that border-line adjustments shall be made only in the light of the total evidence when the results are complete. If ad hoc adjustments are made by individual examiners some candidates receive additional marks which others are denied, and there is no means of deciding which are the enhanced marks and which are the true pass marks. The net effect is to introduce additional uncertainties and to reduce the validity of the final results. The task of the examiner is to estimate the merit of the scripts as carefully and consistently as possible, on whatever scale is natural to him, and to leave it at that. His marks can then be accepted as valid measures, subject only to scaling requirements. It will be necessary in future examinations to issue specific instructions to examiners on this point.

Fig. 10.9B shows a remarkable case where the J-effect occurs twice. Apparently the examiner was under the impression that the pass mark was 30, and the marks immediately below 30 were raised. Subsequently he discovered that the pass mark in English is 36. and repeated the process at the higher level. The result is a 'double J' of which one or two other examples have been found.

The high incidence of the J-effect means that many candidates have received a few extra marks, as many as 10 in extreme cases. It is not possible to determine who these candidates are, except by re-examining many thousands of scripts, which is an impracti cable procedure. The resultant errors, all favourable to the candidates, have the effect of giving a small positive bias to the results which we have no means of correcting. These errors, though unknown, are nevertheless much smaller han those which arise from the variations in the standards of the examiners, which are corrected by scaling.

IX—THE FINAL RESULTS

This report has been chiefly concerned with the methods adopted to secure a valid set of marks. When these marks are tabulated and added it is the function of a committee of the Academic Council to review the results and if necessary moderate them, before they are passed for publication. This procedure remains unchanged. At this last stage, however, the new methods show another important advantage. Formerly it was not possible to estimate the final pass percentage until the results were virtually complete. Now, after randomisation, every page of the tabulation register (which is in numerical order) is a random sample of the zone to which it refers. Accordingly, from a few sample pages, a good estimate can be made of the final result at an early stage in the tabulation. Nearly a fortnight before the tabulation was finished a sample of 16 pages, including 388 results, was investigated. This sample yielded a pass percentage of 54.5% with a standard error of 2.5%. The final pass percentage was 50.7% ,which differs from the sample by one and a half standard errors. There is nothing remarkable about this difference, indeed about one sample in seven would be expected to diverge from the true value by as much as this. The agreement is therefore good, but higher precision could be attained by taking a larger sample.

In the past, border-line cases have been moderated by the use of a formula which ensures that candidates with the minimum total do not fail on account of small deficits in one or two subjects. In a recent publication[4] it has been pointed out that some such procedure is necessary, otherwise some students who fail are better than others who pass. But the moderation should be based, not on arbitrary 'grace marks', but on a consideration of the

4. H. J. Taylor and L. N. Tluanga. *Grace Marks*'. Gauhati,: University of Gauhati.

passing probabilities. In this examination a modified formula was adopted, so adjusted that it gave results very similar to what would have been given by the use of the probability tables. Since the great majority of candidates are somewhere near the pass line in one or more subjects, the final results are rather sensitive to small changes in the passing formula. This is one reason why the pass percentages of Table 10.1 vary so much. The number of candidates is so large that the ordinary statistical fluctuation in the pass percentage should be very small. The variations shown in Table 10.1 must therefore reflect differences in the general level of the examination from year to year, and differences in the adopted passing standard.

The actual extent of border-line adjustment employed in this examination does not greatly differ from that of the previous year. The increase in the pass percentage from 38.2% to 50.7% is chiefly due to the use of the new methods. It has been pointed out previously that where there is a large element of chance it is much more likely, near the border-line, that good candidates will fail than that bad candidates will pass. Any methods which reduce the element of chance are therefore likely to increase the pass percentage. Whether the increase can be wholly explained in this way is a matter for investigation. The Examination Research Unit is working on a 4% sample to determine what the result would have been if the old methods had been left unchanged. The comparison will be published in due course.

X—DISCUSSION

The complex operation described in this report has yielded information of great value. It is now abundantly clear that the element of chance in the conventional examination is far greater than has previously been suspected, on account of the unpredictable variations between the standards of different examiners. To a very large extent, scaling compensates for these variations, and there can be no question that the scaled marks give a result of greater validity than would otherwise be possible. Passing or failing now bears at least some relation to the candidate's true performance, and is no longer wholly determined by the accidental distribution of scripts amongst examiners. We secure a double advantage: more candidates pass the examination, and it is much more likely than before that these are the ones who ought to pass.

The fact that examiners work on widely different standards, even under the most favourable conditions, has been known for many years, but most of the previous results have been based on small-scale experimental studies. This is the first time in India that systematic mark analysis has been applied in a major examination which is fairly representative of the examinations conducted by Universities and Secondary Boards. There is little doubt that had the analysis been applied to any other of these examinations, the conclusions would have been broadly similar. This is a very serious matter for the

State, and for the country, for we can no longer afford to choose our matriculates, and our graduates, by chance. No doubt the best candidates will pass, and the worst ones fail, on nearly any kind of examining, but even for these no reliance can be placed on the order of merit. For the great majority in the middle ranges the placing is entirely fortuitous. Sir C. P. Snow in his recent Richmond lecture commented on the eleven plus examination in terms which might well be applied here: "You could pick out a stratum of academic flyers—that is fairly easy. You could pick out another stratum of children not well equipped for any kind of academic training.... In between comes a gigantic belt; and, if you are going to choose within this belt at all, you might as well tosss up for it."

It is not claimed that the present study is the last word on the subject. In many ways it is only the first word, for much remains to be done. Now the nature of the mark distributions is known, it will be possible to simplify the procedure. The theoretical and practical problems involved in scaling are under investigation. But we have already reached the point where attention must be directed to the other sources of error. We must consider the accuracy and reliability with which an examiner can estimate the merit of a script, and the extent to which he maintains a consistent standard. Work on these problems is now in progress.

Ultimately an even bigger question will have to be faced. An examination is a means to an end, not an end in itself. It is an instrument by which we select the better students and reject the worse ones. By using the techniques of randomisation, analysis, and scaling we make the best use of the information which the instrument supplies. The results are fairer to all concerned, and more dependable, than if these techniques were not used. But the conventional type of examination is at best a very poor instrument for measuring human abilities and skills. It needs to be re-designed, with defined objectives, so that it really measures what it is supposed to measure. Until this is done we shall have to accept a large element of chance, and the serious wastage of human resources which this involves.

It will also be necessary to reduce the dominance of the final examination, and find means of evaluating the progress of the student as his work proceeds, by cumulative records and internal assessments. A student may work steadily for years, but no account is taken of it, and we judge him entirely by what he can produce in a final examination, fighting against the clock under considerable mental and emotional strain. There are times when a student's whole future life hangs on the outcome of a single paper, and it is manifestly unjust.

> "to set so rich a main
> On the nice hazard of one doubtful hour"[5]

5. K. Henry IV, part I; IV, i.

The present work provides at least provisional answers to some of the urgent and immediate problems in the field of examinations. But the future of the country will largely depend on the energy and resolution with which the larger problems are faced and solved.

Statistical Reform of The System of Evaluating Result of Mass-Conducted Examinations

V. M. DANDEKAR

I THE PROBLEM

The unsatisfactory character of mass-conducted examinations is generally recognized. It is also recognized that so long as the examinations continue to be mass-conducted, any reform of the system will have to be based ultimately on certain statistical principles. Numerous proposals have been made from time to time towards this end. The Com-mittee on Examination Reform appointed by the University Grants Commission has also made certain recommendations along the same lines.[1] Since the publication of the report of this Committee, a certain amount of experience has also become available on the use of these principles, through their application in the University of Gauhati (Taylor, 1963 ; Tluanga and Taylor, 1964). The purpose of this paper is to examine the recommendations made by the UGC Committee and the specific statistical principles employed by the University of Gauhati and to put forward a comprehensive proposal for a statistical reform of the examination system.

The UGC recommendations

The relevant recommendations made by the UGC Committee are the following:

> No.7. The present methods of marking examination scripts and of combining and tabulating marks in university examinations without reference to recognized statistical procedures, are not satisfactory.

1. University Grants Commission. *Report on examinations Reform.* New Delhi, 1962, p.45.

This paper is reprinted from *Indian Educational Review* III—1, Jaunuary, 1968 by kind permission of the National Council of Educational Research and Training, New Delhi, and the author.

The procedures will have to be developed to make marking and combining of marks more objective.

No. 9. In universities where more than one media of examination exists, the examiners in the different media (at least head examiners) should meet and define the standards and spread of marks to be adopted in the evaluation work undertaken by them, in order to avoid variation in the marking of scripts.

There are thus three distinct issues: (i) the marking of scripts in each individual subject; (ii) ensuring comparability between the marking of scripts in the same subject but answered in different media; and (iii) the combining of marks secured by a candidate in the different subjects offered by him so as to obtain a 'Grand Total'. We should first understand what the problems in each of these issues are.

There are fundamental questions regarding the evaluation or grading of the performance of different candidates in a given test. These problems exist even if the test is being administered by a single examiner and only to a small number of candidates. Here we shall not concern ourselves with these problems. But there are special problems in this respect in a mass-conducted examination in which several hundred or, in fact, several thousand candidates are involved. The problems arise from the fact that the answer scripts of all the candidates cannot be examined by one and the same examiner but that they have to be distributed over a large number of examiners. Hence, in marking scripts submitted by different candidates in the same subject in a mass-conducted examinations, the problem is one of ensuring comparability between different examiners. Ensuring comparability between the marking of scripts in the same subject, but answered in different media, is only a special case of the same problem and, if a workable solution is found for (i), the same may be extended to (ii). The problems of combining marks secured by a candidate in different subjects so as to give a Grand Total are of different nature. The purpose of the Grand Total is to serve as a measure of aggregate performance. The basic problem here is one of determining the relative importance or 'weight' to be attached to performance in different subjects. Once this is determined or decided upon, the marks secured in different subjects can be combined into a single measure of aggregate performance. Let us now examine the three sets of problems, one by one.

Non-comparability between marking by different examiners

The basic factors resulting in non-comparability between marking by different examiners are the subjective judgments and biases of individual examiners. There are several ways in which such subjective elements affect the marking of scripts. One is the imperfect and varying understanding on the part of examiners of the questions set in the question paper and of what is expected of the candidates. This factor is sought to be kept to a minimum

by specifying in elaborate detail the questions set and the answers to be expected. This, of course, helps but it does not work equally well with all examiners and in all subjects. Therefore, there arise frequent cases when an examiner has either uniformly overrated or underrated the scripts examined by him. There also occur cases of quite erratic marking. However, these may be either because of lack of understanding or due to sheer irresponsibility on the part of the examiner. Unfortunately, irresponsible behaviour is not uncommon. This also results in gross marking whereby marking is confined to only a few typical marks, or in safe marking whereby all borderline cases are pushed into the Pass class. The second important factor which lets the subjective biases of the examiner affect his marking of scripts is the conditions and the environment in which he works. The only care being taken in this respect at present is to give each examiner only a reasonable load of work and an adequate remuneration. However, by and large, the examiners examine the scripts at home where the working conditions are far from ideal. There is little doubt that if the examiners are required to examine the scripts only during regular working hours and in officially provided working rooms or halls, a great improvement in the standard of makring will take place.

There is yet another way in which the subjective judgement of the examiner affects the marking of particular scripts. It arises out of the average quality of the bunch of scripts which an examiner is required to examine. It is well recognized that in spite of the clearest instructions and understanding about the answers to be expected, the expectations of the examiner are affected and influenced by the quality of the scripts he is examining. If the average quality of the bunch of scripts is good, a sub-average candidate is often judged too harshly. On the other hand, if the average quality of the bunch of scripts is not so good, an aobve-average candidate is judged too liberally. In fact, it is not difficult to demonstrate that the same script, placed, in different bunches of average quality, may be judged differently even if examined by the same examiner. The only means to correct this situation is to ensure that the bunches of scripts being allocated to different examiners are more or less of equal average quality.

The need to allocate bunches of equal average quality to different examiners

There is another and probably more fundamental reason why the bunches of scripts allocated to different examiners should be of equal average quality. Suppose that the bunches of scripts given to different examiners are not of equal average quality or that it is not known that they are of equal average quality. In the circumstances, we cannot reasonably expect that the marking of these bunches by different examiners should be nearly equal. Even if there are pronounced differences between he marking of the different bunches, we cannot be certain that they do not reflect real quality differences between the bunches. Therefore, we dare not adjust the marks given by an examiner even if we suspect that they are affected by the strong personal

biases of the examiner. All that we may do is to require a moderator to re-examine a few scripts, probably some borderline cases, and revise the marks given by the examiner if it is found necessary—but only in those few cases actually re-examined. However, even if a whole bunch seems to have been overmarked, or undermarked, or erratically marked, or uniformly marked, or safely marked, there is nothing that we can do except to ask the moderator to examine the whole lot. Except for re-examination and reassessment by the moderator, the marks given by the examiner are thus sacrosanct and cannot be touched. Because of the large number of scripts to be examined and assessed and the extremely short time within which the final results have to be prepared, the scope for re-examination and reassessment by the moderator is indeed small, and in practice, for a large majority of the scripts submitted, the marks given by the examiner stay untouched. Thus, so long as the bunches of scripts allocated to different examiners are not known to be nearly equal in their average quality, there is no way of comparing the behaviour of different examiners and correcting the one who is found to behave rather peculiarly. In order to be able to do this, the bunches of scripts allocated to different examiners must be of equal average quality.

The principle of randomization

We must therefore look for a method of allocating bunches of scripts to different examiners so that their average quality would be more or less equal. There is of course no way of knowing the quality of a script until it is examined. Nevertheless, the allocation of scripts to different examiners must be done before the scripts are examined, and this has to be done in such a way that the average quality of the bunches given to different examiners is approximately the same. There is only one way of doing this, and surprisingly, it is the process of random allocation. It is a basic statistical principle and it can be easily demonstrated, that if the scripts to be given to different examiners are allocated on the basis of random selection by means of process equivalent to the drawing of lots, then the lots given to different examiners will be approximately of the same average quality. The lots, when they are so allocated, will not of course be of exactly the same quality. There will naturally be some differences between them. However, the differences between such lots are governed by three important statistical properties:

1. Firstly, the differences between the lots are smaller, the larger the lots. For instance, lots of 400 scripts each will be more nearly equal in their average quality than lots of say, 100 scripts each.
2. Secondly, and this is even more important, given the size of the lots, the range of likely differences between them can be judged in advance. For instance, with lots of, say between 250 and 300 scripts each, it can be demonstrated that the mean or the median marks of different lots should all lie within a narrow range of two or three marks

3. Thirdly, the randomized lots are more or less alike not only in their average quality as judged by the mean or the median marks, but also in their internal variation or the spread of marks over different scripts in each lot. Further, whatever differences may legitimately exist in such respects can also be judged in advance.

Consequently, once lots of scripts are allocated to different examiners on the principle of randomization, any lot showing a very different level or pattern of marking may be suspected to have been affected by rather pronounced subjective factors of the examiner and hence calling for revision. In other words, once the different examiners are given random lots of scripts, it will be reasonable to expect a common pattern of marking and, if the different lots show unreasonably different patterns of marking, it will be justifiable to reduce them to a common pattern. Subsequent procedures are concerned with how to reduce the markings by different examiners to a common pattern.

II—GAUHATI UNIVERSITY EXPERIMENT

The several problems that arise are best illustrated by reference to the procedures adopted by Gauhati University. In a report on this subject by Dr. H. J. Taylor, Vice-Chancellor of the University, (pp 98-114) the following is observed:

> Ideally marks should be scaled so that all sets of marks have: (a) the same mean or median, and (b) the same standard deviation. Of these (b) presents the more difficult problem, which needs further study before a solution can be supplied with confidence. In the present work, only median scaling has been carried out, but this ensures that at least the major errors arising from the variation of standards are removed. (Taylor, 1963).

The median scaling, as adopted by Gauhati University, consists of the following:

(i) For the scripts examined by each examiner, the median mark is found out. The median marks is the mark above and below half the candidates lie.

(ii) The average of the median marks of different examiners is then worked out, and treating this as the norm in those cases where the median mark of an examiner differs from the norm beyond a certain range, the marks in the whole lot examined by)that examiner are adjusted, that is to say, raised or lowered until the median comes to the value chosen as the norm. There are certain complications at both the extremes, so that candidates are not given marks either below zero or above 100, but that is a matter of detail which need not concern us here.

Appreciating fully that Gauhati University has only recently made a beginning in this new direction and trusting that the procedures employed

will be improved as more experience is gathered, we offer a few comments with the sole purpose of raising certain important issues involved. In the first instance, there is the fact that in the procedure at present adopted marks are adjusted for the differences in the median marks only and not in the spread of marks. The reason is that the latter adjustment is the more difficult of the two to carry out. We shall later examine the question as to how difficult it is to adjust for the differences in the spread of marks. Our immediate concern is to emphasize the implications of adjusting for the median marks only and not for the spread at the same time. Adjusting for the median marks only presumes that the nature and the magnitude of the subjective bias of the examiner are the same at the median level as also at the high and the low levels. Thus, if the median marks given by an examiner are above the norm by 5 marks it is presumed that the examiner has overmarked all scripts uniformly by just 5 marks. For all we know, this may not be true. It is not only the magnitude of the bias that is likely to be different at the two ends of the scale, but some times also its direction. It is quite conceivable, for instance, that an examiner is considerate at the lower end but more exacting at the higher end or that he may be more hard at the lower end and generous at the higher end. Hence, a mere adjustment for the median mark by means of a straight raising or lowering of all marks might merely exaggerate his biases at either of the ends rather than correcting them. The Gauhati report in fact points out a phenomenon of this nature, which it terms the 'J--effect', namely, the large clustering at the pass mark of 35. It will be clearly disastrous to lower these marks along with the median mark. On the other hand, if they are raised along with the median, we could be giving a few additional marks to a group of candidates who have already received grace marks at the hands of the examiner. In the procedure adopted by Gauhati University, these borderline cases are presumably left untouched. The case however illustrates the defects of adjusting for the median without at the same time adjusting for the spread.

The second important aspect of the procedure adopted by Gauhati University is the choice of the norm to which the median marks are adjusted. As already pointed out, the average of the median marks given by the different examiners is taken as the norm. This means that the actual median marking by the several examiners in a year is itself taken as the norm for adjusting the median marking of different examiners. It follows that the norm to be adopted for adjustment of marks may fluctuate from year to year. Therefore, it is necessary to ask the question as/to what extent such year-to-year fluctuations in the performance of candidates as judged by the examiners, are justified. The annual fluctuations may be due to two sets of circumstances. In the first instance, the groups of candidates appearing in different years may differ in their quality, in the standards of teaching they were subjected to, and generally in the level of their preparation for the examination. This is not impossible. However, considering that we are concerned with groups of several thousand

candidates, taught in several hundred schools by several hundred teachers, it is almost certain that in their quality, in the standards of teaching they are subjected to, and generally in their preparation for the examination, these groups cannot show wide fluctuations from year to year. Changes in these matters are bound to take place but such changes will be slow, gradual and evident only over a period of time. From one year to the next, the groups of candidates will remain almost stable in their preparation for the examination. Consequently, the year-to-year fluctuations can almost certainly be due to only the second set of circumstances, namely, the standard of the question paper set, the standard of marking adopted and a host of other circumstances incidental to the conduct of the examination. Such fluctuations probably are unavoidable. However, it is necessary for that reason to protect the candidates from their effects. It is clearly necessary therefore to adopt norms for each subject, such that they will not vary from year to year, at the same time keeping open the possibility of reviewing them periodically and adjusting them in the light of the changes taking place in the quality of the candidates and their preparation for the examination.

III—ADOPTED PROPOSED METHOD OF SCALING

As has already been said, the purpose of these critical remarks on the procedures adopted by the Gauhati University is to raise and illustrate certain relevant issues. It is now proposed to put forward a procedure for adjusting the marks given by different examiners in a subject which we trust is free from these shortcomings and which we hope will also be simpler to operate.

The basis of this proposal is exactly the same as that which the Gauhati report mentions to be the ideal procedure; it says: "ideally, marks should be scaled so that all sets of marks have (a) the same mean or median, and (b) the same standard deviation." The mean or the median are particular measures of the average level and the standard deviation is a particular measure of the spread of marks. Therefore, if two sets of marks are so adjusted that they have the same mean or median and also the same standard deviation, we may expect that the two sets of marks would have the same average level and the same pattern of distribution marks. However, this is not entirely true. Two sets of marks having the same mean or median and also the same standard deviation may differ in several important respects. For instance, the following results are based on the analysis of marks obtained by a sample of 1000 candidates appearing for he March 1959 examination of the Maharashtra S.S.C. Board.

Subject	*Mean marks*	*Standard deviation*	*Percentage of passes*
Language (Higher level)	41.50	11.09	84.17
Language (Lower level)	39.03	11.65	76.01

Thus two sets of marks, very nearly equal in the mean and also in the standard deviation, differ greatly, by as much as 8 per cent, in the percentage of passes. Several such examples may be given. The reason why two sets of marks with the same mean and standard deviation do not agree in several important respects is simple. As pointed out above, the mean and the standard deviation are particular measures of the average level and of the spread of marks. These measures would have special significance only if the distributon of marks, as given by the examiners, were perfectly 'normal'. The term 'normal' here does not mean more than a particular form of statistical distribution. If the distribution of marks were perfectly 'normal' in this sense, it could be shown that two sets of marks having the same mean and the same standard-deviation would agree in all other respects. In point of fact, sets of marks are shown to be distributed not quite normally. It is for this reason that two sets of marks having the same mean and the standard deviation may differ in quite important respects. Therefore, adjusting marks for mean and standard deviation is not entirely satisfactory in that even after such adjustment, two sets of marks still differ in quite important respects. Moreover, as the Gauhati report points for mean or median is relatively simple but that for standard deviation is fairly complicated. In fact, for that reason the procedures adopted by the Gauhati University permit adjustment only for the median. This is all the more unsatisfactory. In the first instance, a flat adjustment for median might introduce serious errors. Secondly, two sets of marks adjusted only for the median may, and in fact almost invariably do differ in several major respects. Thus, it will appear that adjustment of marks for median and standard deviation is neither simple to carry out nor does it adequately satisfy its purpose, namely, to bring the different sets of marks to a common pattern of marking. In what follows, it will be argued that if the purpose of adjusting marks is to reduce the different sets of marks to a common pattern of marking, then this can be effected more directly and simply without reference to either the mean or the median and the standard deviation.

Pattern of distribution of marks

As mentioned above, the mean or the median are particular measures of the average level of marks obtained by a set of candidates and the standard deviation is a measure of the spread of marks within the set. These measures are often referred to as the measures of 'central tendency' and of 'dispersion' of a distribution. When the distribution of marks is 'normal', which is a particular form of statistical distribution, the arithmetical mean and the standard deviation as measures of 'central tendency' and 'dispersion' are of particular significance because two 'normal' distributions, agreeing in their mean and standard deviation, agree in all other respects. When the distribution of marks is not 'normal', these measures are of no particular significance and they offer only inadequate description of the pattern of distribution. Two 'non-normal'

distribution agreeing in their mean and standard deviation may differ in many important respects.

The distribution of marks as given by examiners are usually not normal, and often they are far from being normal. Under these conditions, it may be advisable to adopt certain measures which are more direct descriptions of the pattern of distribution. The simplest and the most direct description of a pattern of distribution is to indicate the number or the proportions of candidates who have secured marks between certain ranges. For instance, we may indicate the proportion of candidates who have secured 60 or more marks; between 45 and 59 marks; between 35 and 44 marks; between 25 and 34 marks; and 24 or fewer marks. These ranges of marks are the same as those which are usually valued as first class, second class, pass, condonable, failure and non-condonable failure. Let us for convenience denote them by A, B, C, D and E classes. Two sets of marks which agree in respect of the proportion of candidates falling in each of these classes will have patterns of distribution which are similar for all practical purposes. If a closer agreement is desired, we may split up some of the five classes mentioned above and obtain, say, seven or even nine classes. Two sets of marks agreeing in respect of the proportion of candidates falling in each of seven classes will evidently agree in their pattern, of distribution even more closely, and if they agree in respect of nine such classes, the agreement will be all the more close. It seems that specifiying five classes will be found to be quite satisfactory; specifying seven classes will be found to be quite adequate; and specifying nine classes will provide an almost complete description of the pattern of distribution. Table 11.1 gives an illustration of the descriptions of nine classes.

TABLE No. 1

Range of marks	*Class*
90 and above	A_1
75-89	A_2
69-74	A_3
45-59	B
35-44	C
25-34	D
15-24	E_1
5-14	E_2
4 or less	E_3

If we specify the proportion of candidates which should fall in these classes, we would have specified the pattern ofdistribution of marks almost completely.

The problem of norms

Let us recapitulate for a moment the position we have reached. It is this. If different examiners in a subject are allotted random lots of answer scripts, then, provided the examiners are free from subjective biases, we should expect the set of marks given by each examiner to follow the same pattern, which means that the proportion of candidates given marks falling between various ranges of marks such as those indicated in the system of five, seven or nine classes mentioned above, should be the same for each examiner. If different examiners do not show the same pattern of marking, we should suspect the markings as being affected by the individual biases of the examiners, and hence we proceed to adjust the marks given by an examiner whose marking departs from the common pattern, so as to bring it in line with the common pattern. The question naturally arises; what is the common pattern to which the marking by each examiner should conform or else be adjusted ? In the following, two alternative solutions are put forward.

In the first instance, we may adopt the pattern of marking indicated by all the examiners if their markings were pooled together. Thus, after all the examiners have marked their lots of answer scripts, we should obtain a combined distribution of marks. Let us suppose, the proportion of candidates in the various classes in the combined distribution to be as in Table 11.2

TABLE No. 11.2

Range of marks	*Percent of candidates*
90 and above	1
75-89	4
60-74	10
45-59	15
35-44	20
35-34	20
15-24	15
5-14	10
4 or less	5
	100

This is, of course, the pattern of marking in the combined distribution. The pattern of marking of each examiner within the set of scripts examined by him will of course differ from the 'common' pattern by varying degrees. As the first alternative, we suggest that the marks given by each examiner should be adjusted so as to bring the pattern of this marking in confromity with the 'common' pattern. This is adequate for the immediate purpose in hand, though it has two shortcomings which we should note. In the first place, as we have

earlier noted, it implies that the common pattern may vary from year to year—which variation may be wholly unjustifiable. Secondly, this procedure means that the process of adjusting marks given by individual examiners cannot begin until the lists of marks are received from all the examiners, pooled together and norms established. In practice, this may cause operational delays. However, subject to these two shortcomings, the procedure meets the main purpose, namely, to bring the level and pattern of marking of different examiners to a common norm. This procedure has also the advantage that it does not require any externally established norms. The marks given by different examiners are brought in conformity with their own combined average.

As mentioned above, the procedure implies that the norms for a subject may fluctuate from year to year. We have earlier argued that such year-to-year fluctuations in the norms may be wholly unjustifiable. If this view is accepted, it will necessitate establishing norms which will not change from year to year but which may be revised in the light of any long-term changes taking place in the quality of students, or in the quality of their preparation for the examination. The simplest method to do this is to establish the norms on the basis of recent past experience. With this purpose in view, we should examine the actual marks given by all the examiners in the last two or three years, work out what proportions of students were given marks falling between the various ranges such as 90 and above, between 75 and 89 ,etc. These proportions would then establish the norms which might remain unchanged for the next two, three or five years, or which may be changed as and when evidence of any long-term changes taking place becomes available.

It should be clear that, whether we accept the average level and pattern of marking of all the examiners in the current year as the norms for adjustment or the average level and pattern of marking of all the examiners during the past two or three years as the norm for adjustment, the subsequent procedures would be exactly the same. The distinction between the two methods of establishing norms is minor but nevertheless important. The distinction mainly lies in that while the first method implies that norms may fluctuate from year to year, the second implies that they should not, unless positive evidence becomes available for long term changes taking place. The distinction is a matter of operational convenience. The first method requires the mark lists from all the examiners to come in before norms can be established and the process of adjustment begun. In the second case, the norms are already established and hence the marks given by each examiner can be immediately compared with the norms and adjusted if found necessary. Subsequent procedures of adjustment are, however, exactly the same in the two cases.

Procedures for adjusting marks given by an examiner

Let us now turn to the procedures for adjusting the marks given by an examiner if they are found to deviate from the norms whether established

on the basis of the curent year's performance or the past few years' performance). To begin with, we must emphasize that the norms that we are now talking about are not just mean or median, or even mean or median with standard deviation. The norms consist of the entire statistical distribution of marks specified by proportions of students falling in various ranges of marks. As we mentioned earlier, specifying the distribution by means of five class ranges would be satisfactory; specifying by means of seven class intervals would be quite adequate; and specification by means of nine class intervals would be almost complete. As an illustration, let us suppose that the norms are specified in terms of proportions of students falling in nine classes. To make the example correct, let us suppose that the norms correspond to the distribution given in Table 11.2. For the purpose of the subsequent discussion, it makes no difference whether the norms are established on the basis of the current year's performance or the past few years' performance.

Referring to the distribut]on in Table 11.2 and noting that the norms require 1 per cent of all students to secure 90 or more marks, 4 per cent to secure between 75 and 89 marks, and so on, the obvious thing to do would be to rank all the students in the descending order of the marks given to them by an examiner and then suppose that the top 1 per cent have, in fact, earned 90 or more marks that the next 4 per cent have, in fact, earned between 75 and 89 marks, and so on. Thus the process of adjustment involves the following.

1. Ranking all scripts examined by a single examiner, in the descending order of the marks;
2. Supposing that the top 1 per cent, forinstance, have in fact earned 90 or more marks; that the next 4 per cent, foi instance, have in fact earned between 75 and 89 marks; and so on.

It is thus that we could bring the distribution of marks given by the examiner in complete agreement with the distribution comprising the norms. Let us now ask the next question. What do we do to the marks given on each script ? Do we change them in accordance with what we would want them to be ? It seems that this will have to be done. If this is to be done, the procedure may be as follows. Suppose that the top 1 per cent should have 90 or more marks, but that, in fact, the last of these is given only, say. 86 marks. We may then raise the marks of the top 1 per cent of the scripts by 4 marks, subject to the condition that no one should have more than 100 marks. In the same manner, if we need that the next 4 per cent should have between 75 and 89 marks but find that the last of these scripts is given 72 marks, then we may raise the marks on all these scripts, by 3 marks, subjects to the condition that none in that group should get 90 or more marks. We may proceed thus, class by class, throughout the distribution. Evidently, in some cases we may have to reduce the marks given on certain scripts in order to bring them within specified limit Clear and unambiguous rules may have to be framed for the purpose but

there should be no difficulty, in principle, to doing this. It is obvious nevertheless that the procedure would be cumbersome and, operationally, too complicated. In what follows, proposals are put forward, which will obviate all the difficulties accompanying to be made in the marks given by an examiner.

Let us for a moment return to the first stage of the adjustment process. As has been mentioned earlier, it requires the ranking of the scripts examined by a single examiner in the descending order of the marks given to them. Having done this, we have to identify the first 1 per cent, the next 4 per cent, and so on, of the scripts which the specification of norms requires should fall within certain class ranges. This is what we have called the first stage in the process of adjustment. The second stage consists of changing the marks given by the examiner, the numerical marks should be converted into letter grades. Concretely, in terms of our illustration, it is proposed that having identified the top 1 per cent scripts instead of changing the marks on them so as to bring them within the specified range of 90 to 100, we should merely place the grade A_1 on these scripts. In the same manner, having identified the next 4 per cent scripts, instead of changing the marks on them so as to bring them within the specified range of 75 to 89 marks, we should place the letter grade A_2 on these scripts. In brief, taking the distribution given in Table 11.2 as specifying the norms and taking the letter grade nomenclature suggested in Table 11.1 both of which are purely illustrative, the proposal amounts to as follows: After ranking all the scripts examined by each examiner, in the descending order of the marks given to them, the top 1 per cent should be given the letter grade A_1; the next 4 per cent should be given grade A_2; the next 10 per cent grade A_3; the next 15 per cent, grade B; the next 20 per cent, grade C; the next 20 per cent, grade D; the next 15 per cent gade E_1; the next 10 per cent grade E_2; and, finally, the last 5 per cent should be given the grade E_3. To avoid any misunderstanding, it is repeated that the grade nomenclaure and the proportions attached to the various grades in the above example are purely illustrative.

IV IMPLICATIONS

Let us now examine the implications of these proposals. The first and the foremost implication is the limited importance and meaning attached to the actual marks given by an examiner. We accept that a script which is given a higher mark than another is better than the other. In other words, we accept the rank order indicated by the marks given by the examiner. This is as it should be; for, it must be understood, nothing short of re-examination of the scripts can alter the rank order indicated by an examiner. So we accept his rank-ordering. But we accept no more. We do not accept the absolute distance his marking indicates as between different scripts. In other words, we do not attach any absolute importance to the numerical marks given by the examiner. For the same reason, we do not care to change the marks given by him. We

accept his rank-ordering of the scripts and we accord, say the first 1 per cent, grade A_1; the next 4 per cent, grade A_2, etc. This implies that a certain proportion of scripts from the lot examined by each examiner will be accorded a certain grade such as A_1, A_2, A_3 B, C, D, E_1, E_2, or E_3. The justification for this is the fact that each examiner is given a random lot of scripts to examine.

The converting of numerical marks given by different examiners into letter grades constitutes a major step forward in reforming the present examination system in India. Operationally speaking, it is immensely more simple as compared to any system of changing marks given by an examiner. Combined with the principle of allocating to each examiner a random lot of scripts to examine, it achieves comparability between evaluations by different examiners without doing explicit violence to the marks given by them. At the same time, it rids the examination system of the absolute omniscience of the marks given by an examiner. It should be understood that we cannot get rid of the numerical marking by the examiners altogether. For instance, it will not do if we ask the individual examiners to assign grades rather than numerical marks. In that case, there will be no guarantee that the grades assigned by different examiners are comparable. It is a necessary step in the above procedure that each examiner assigns numerical marks. It is only by rank-ordering the scripts on the basis of the marks assigned by each examiner that grades may be assigned which will ensure comparability of evaluation as between different examiners. Thus, though we finally get rid of the numerical marks assigned by the examiners, it is important to realize that the numerical marks perform an essential function, namely that of rank-ordering the scripts examined by each examiner.

The problem of combining grades in different subjects

Once numerical marks are coverted into grades, there arises the problem of combining the grades obtained in different subjects. Numerical marks in different subjects can be added together but the letter grades cannot be so added. However there are well-known statistical procedures for converting letter grades into numerical scores, normalized or otherwise, and after such scores have been added together, for reconverting the total score into a grade. Any one of these procedures may be adopted. Of course, the conversion of grades into scores has to be done for purposes of arriving at an over-all grade. Scores imply a system of weights to be attached to different grades before they are combined to give a single over-all grade. Scores have no further use and they need not appear explicitly on any statement of the examination result to be given to a candidate. Thus the final result of a candidate will not consist of a statement of marks as at present. It will consist only of the grades secured by him in different subjects and a combined over-all grade.

While combining the grades secured in different subjects, yet another problem arises, namely, the relative importance to be attached to different

subjects. Is English as important as, say, mathematics or a regional language or geography? It is to be clearly understood that these questions must be answered on pedagogic and not statistical considerations. Once a number of subjects are regarded as of equal importance, the simplest method to accord equal importance to them is to assign to them equal marks in the grand total. Thus, if each of seven subjects is accorded 100 marks in a grand total of 700, it means that they are all considered as being of equal importance. On the other hand, if it is intended to attach greater importance to any subject, the simplest method is to raise its marks in the grand total. For instance, if it is intended to attach double importance to English it should be assigned 200 marks while the other six subjects would have 100, marks each in a grand total of 800 marks. It follows logically that if English is to be given double importance, the examination in English should be of double load or duration and in fact the curriculum in English should also be double in comparison to that in other subjects. In other words, and using common parlance, there should be two papers in English. This seems reasonable. However, from the standpoint of our present discussion, this is not necessary. It will be perfectly legitimate to keep the curriculum and examination load in any subject such as English the same as in other subjects and nevertheless give it double importance by assigning 200 marks to it in a grand total in which the other subjects are assigned only 100 marks each. The more important point for the purpose of the present discussion is that the relative importance to be attached to different subjects that a candidate offers is a matter which must be settled entirely by pedagogic considerations, and that, once this is settled, no problems arise while combining the marks in the different subjects. In the event, the marks in each subject are converted into letter grades as we have proposed above; and while combining the grade scores in different subjects, the intended weights much be attached. There are no further problems in combining marks or grades in different subjects.

Certain problems in the establishment of norms

This completes the discussion of the issues raised by the recommendations made by the UGC. Before concluding, a few extensions of these issues may be briefly indicated. The central issue, as will be realized, is how to ensure comparability between the evaluations by different examiners of answer scripts in a subject. This requires the establishment of norms. Our procedure requires that the norms should comprise a specification of certain grades in descending order of merit and specification of certain proportions of candidates which should be accorded these grades. Earlier, we have raised the question as to the basis on which such norms may be established. One method is to base the norms on the average judgment of all the examiners in the current year. This method has the operational inconvenience that the norms are not established until all the examiners return their scripts and a

certain amount of tabulation of the total results is done. A more serious objection to the procedure is that it may result in the norms fluctuating from year to year, and these fluctuations may be entirely unjustifiable. As an alternative, the norms may therefore be established on the basis of the past three or five years' average evaluation by the examiners. This may keep the norms more steady and, at the same time, permit a gradual change in them from year to year. The choice between the one or the other method will depend upon what view we take regarding the year-to-year fluctuations in the results.

There is another analogous problem. Should the norms be the same for different subjects or may they be different ? If we base our norms on the average evaluation by the examiners in each subject, whether in the current year or in the past three or five years, it is obvious that the norms will be very different in different subjects, in the sense that the proportions of students who will be accorded certain grades will be different in the different subjects. The wide range of variation in the standard of evaluating scripts in the different subjects, as it exists today, will be evident from the following percentages of passes in different subjects at the March 1965 S.S.C. Examination in Western Maharashtra.

Subject	*Percentage of passes*
Marathi (Lower level)	89.10
Gujarati (Lower level)	93.83
Hindi (Lower level)	57.21
English (Lower level)	43.58

Thus the pass percentages vary from 43.58 per cent in English to 93.83 per cent in Gujarati. Languages are usually offered at the lower level when they are not the mother tongue. Therefore, Marathi and Gujarati in the above were presumably as foreign to the students offering them as were Hindi and English. Why then this large variation in the level of passes? It may be suggested that possibly Marathi and Gujarati were mother tongues and Hindi and English were not. However, even supposing this to be so, why the difference between the pass percentages in Marathi and Gujarati, or in Hindi and English, which though smaller is by no means inconsiderable. The differences in the pass percentages are equally striking if we consider the languages at the higher level in which case presumably they are all mother tongues of the students concerned. The pass percentages in the languages at the higher level were as follows:

Subject	*Percentage of passes*
English (Higher level)	75.87
Marathi („ „)	75.93
Hindi („ „)	81.17

Kannada	(Higher level)	90.84
Gujarati	(„ „)	92.56
Urdu	(„ „)	93.01
Sindhi	(„ „)	96.86

The above requires little comment. The same is true in respect of classical and modern European languages which are again available as equivalent options. The pass percentages in these were as follows:

Subject	*Percentage of passes*
Sanskrit	60.38
Ardhamagadhi	56.97
Persian	82.21
French	87.98

Such variations in the pass percentages are not, of course, confined to languages. They are equally evident in the social sciences, physical science and mathematics. The following are the pass percentages in social science subjects:

Subject	*Percentage of passes*
Social studies	78.24
History	81 89
Geography	65.73
Indian administration and civics	72.82

The difference between the pass percentages in history and geography is noteworthy. The following are the pass percentages in natural science subjects:

Subject	*Percentage of passes*
General science	70.93
Physics and chemistry	61.54
Physiology and hygiene	81.71

One wonders why it should be so much easier to pass in physiology and hygiene than in physics and chemistry. Or, finally, consider the mathematics subjects:

Subject	*Percentage of passes*
Elementary mathematics	58.21
Algebra and geometry	81.90
Arithmetic	45.78

Here again, the difference between the pass percentages in algebra and geometry and in arithmetic is striking.

It seems that, in general, it will be extremely difficult to justify the differences in the pass percentages as they exist today. However, this raises several questions which are beyond the scope of the present discussion. For our immediate purpose, what is relevant is the following: If on any pedagogic considerations, the existing differences between the pass percentages in different subjects are thought to be justifiable, it is obvious that the norms on the basis of which different grades may be accorded in the different subjects will have to be different. In that case, no further problem arises. However, if it is felt that such large differences between the pass percentages are not justifiable, it is obvious that something will have to be done to narrow down the existing differences. One method to achieve this is to reduce the curricular burden in those subjects in which the pass percentages are low and/or increase it in those subjects in which the pass percentages are high. Simultaneously, instructions may have to be given to the examiners and moderators to liberalize marking in those subjects where the pass percentages are low, and/or to tighten it in those subjects in which pass percentages are high. By such means, it may be possible gradually to reduce the existing disparities in the pass percentages in different subjects, though the process will by no means be simple and smooth. We should also remember that once a movement is started in this direction it will be hard to resist the logical conclusion that pass percentages should be more or less the same in all subjects. Once this is achieved, it will amount to adopting uniform norms for accrediting grades in all subjects.

However, if the ultimate intention is to establish uniform norms for adjudging performance in all subjects as we shall presently see, it is quite unnecessary to do this in the manner suggested above, namely, by: (i) adjusting curricular loads in different subjects, and (ii) instructing examiners and moderators to aim at certain pass percentages. In the present instance, let us be clear that the question of the curricular load in each subject must be decided entirely on pedagogic considerations and not to suit particular marking habits evolved by the examination system. If, therefore, we leave this question out, and if we desire that in each subject, a certain proportion of students should pass, there are two choices open to us. One is that suggested above, namely, to instruct the examiners and moderators to aim at the specified pass percentage and to liberalize marking if the pass percentage in the subject is too low and to tighten the marking if the percentage is too high. The other alternative is to vary the passing mark in order that a given percentage of students acquire the passing mark; that is, to lower the passing mark if the pass percentage is too low, and to raise the passing mark if the percentage is too high. This is obviously the simpler thing to do. But we would not do it because of the sanctity which the particular pass mark, namely 35, has acquired in our examination system.

As has earlier been mentioned, the absolute omniscience at present attaching to the marks given by an examiner to a script is the main hurdle in the reforming of our examination system. The notion is so deep seated in our thinking that it will require resolute steps to rid our examination system of the same. Let us therefore be quite clear on this point. In the first place, let us repeat, the assigning of numerical marks to a script by the examiner is a necessary step in the process and therefore it is not suggested that the system of assigning numerical marks should be abolished. All the elaborate instructions that are at present prepared for the guidance of the examiners in their evaluation work are also necessary. In fact, in any mass-conducted examination, these are absolutely essential in order to achieve the maximum possible objectivity in the evaluation procedures. However, having said this, we must be clear regarding the meaning and importance to be attached to the numerical marks given by the examiner. As we have earlier mentioned, the numerical marks given by an examiner to a number of scripts examined by him indicate a certain rank-ordering of the scripts by merit. This is the essential function of the numberical marks given by the examiner and no violence to the implied rank-ordering can be done except by re-examination of one or more scripts by a moderator. But rank-ordering must also be the sole function of the numerical marks given by an examiner and no further absolute importance should be attached to them. This is the crucial point and its implications are:

1. In spite of all the instructions given to the examiners and in spite of all the steps taken to achieve the maximum objectivity in the marking system, marks given by two different examiners to two different scripts are not comparable. They are not comparable in the sense that a mark such as 40 given by one examiner to a script examined by him does not necessarily mean the same thing as mark 40 given to another script examined by another examiner. This is the starting point, and if this is not accepted, no reform in the examination system of the kind under discussion is called for. However, once this point is granted the other two follow logically.
2. The marks secured by a certain candidate in a subject in a particular year are not comparable with the marks secured by another candidate in the same subject but in another year. This is obvious because not only the examiners are likely to be different in the two cases, but also, the candidates would be answering two different question papers, thought in the smae subject.
3. The marks secured in one subject are not comparable with the marks secured in another subject, even in the same year and by one and the same candidate. This, too, is obvious, for in this case not only the examiners would be different but they would be

evaluating scripts in two different subjects under, naturally, very different marking instructions.

Thus the numerical mark assigned by any single examiner to a script has no further validity than as an indicator for rank-ordering the scripts evaluated by him, Once this is accepted, the rule for making the evaluation by different examiners comparable, is simple. Firstly, allocate to each examiner lots of scripts drawn on a random basis. Secondly, after rank-ordering the scripts examined by each examiner, certain specified proportions of them taken from the top to the bottom, successively, should be assigned certain letter grades. If these proportions are predetermined, as we suggest they should be, the work of assigning letter grades after rank-ordering the scripts on the basis of the marks given may indeed be left to each examiner. Further, if it is intended that the standards of evaluation, that is to say the standards of assigning different grades, should be uniform for all subjects, the same may be achieved very simply. The rule is to use for all the subjects, the same norms, specifying certin percentages for assigning certain grades in each lot examined by a single examiner. This implies that the norms will have to be determined by quite independent considerations and not on the basis of the actual marking by several examiners in the current year or in the past few years. In the final analysis, the norms would be based on an arbitrary judgement as to what proportion of candidates should be given varius grades; but the arbitrariness would be no greater than that involved in the existing pass mark of 35, second class mark of 45 or 50 and first class mark of 50 or 70. Finally, in order to work out the over-all average grade for each candidate, the grades in different subjects should be converted into scores, averaged simply or weighted appropriately, and reconverted into an over-all grade. This would constitute the average grade for the candidate for the examination as a whole. The decision as to whether he may be deemed to have passed the examination will have to be taken on the basis of this average grade together with the grades secured in single subjects, by means of suitable rules. There would be nothing new in such procedures.

References

1. Taylor, H. J. (1963). *Operation pass marks: An account of the methods used in the matriculation examination of* 1963. Gauhati: University of Gauhati.
2. Tluanga, L. N. and Taylor H. J. (1964). *The influence of scaling on examination results: A report on a sample analysis of the matericulation examination Results of* 1963. Gauhati: Examintion Research Unit, University of Gauhati.
3. University Grants Commission, New Delhi. (1962). *Report on examination reform.* New Delhi: UGC.

A Method for Adjusting Internal Assessment to an External Standard

A. Edwin Harper, Jr.

[Note : *Section I gives the essential details of the method, and the casual reader need not go any further. The remaining sections are elaborations, details of procedures, theoretical background (but stated in laymen's language), extensions and further applications. One who wishes to develop an understanding of fundamental statistical relationships, stated in non-statistical language, will find Section IV particularly interesting*].

When the marks obtained from both internal and external assessments are to be combined, the problem of "standard" is sure to arise. If the standard of the internal marks is either much higher or much lower than that of the external assessment, obviously some adjustment must be made.

The same, of course, is true when the marks of any two or more subjects or even of any two papers, are combined. Though the method given in this paper has been described in relation to the combining of internal and external assessments, the methods can easily be adapted to other situations where standards ought to be equated. The scaling of the results of different examiners to the same standard can also be done by the same methods. (See Section VII.)

There are various mathematically exact methods for making this adjustment.[1] However, most of them require fairly extensive computations. In a large scale public examination, these computations would not be possible without extensive and expensive use of machines for this purpose. If internal and external assessment marks are to be "equated" and added in large-scale public examinations, some much simpler method must be used.

(1) See any of the following:

Bose, P. K. and Choudhury, S. B. "Scaling procedures in scholastic and vocational tests.." *Sankhya: The Indian Journal of Statistics*, 1955, **15**, 197ff.

Dandekar, V. M. "Statistical reform of the system of evaluating results of mass-conducted examinations". *Indian Educational Review*, Jan., 1968.

This paper deseribes a method for doing this that is so simple that it can be carried out easily by any clerk. No adding, calculating or other machines or special equipment are needed. The method is based on one developed in England.[2] However, this paper contains an extension (section VI) which for our purposes, in an improvement over that method. The method is accurate enough for all traditional type examination work, and is far more accurate than other simple methods hither to proposed. (See Sections IV and V.)

(2) Yates, Alfred and Pidgeon, D.A. *Admission to Grammar Schools.* London, Newnes Educational Publishing Co., Ltd., 1957, pp. 88-92.

I. THE METHOD IN BRIEF

1. Teachers are not asked to submit marks for their students. They are asked only to rank their students in order of merit. This is done separately by each teacher, for the batch of students whose "internal assessment" is his responsibility. (In other words, if there are three sections of Physics, each marked by a different teacher, there will be three "Rank 1" students, one from each section. But if the same teacher marks all three sections, he will put them together and award only one "Rank 1" among *all* the students whom he is to mark.)

(It should be noted in passing that the teacher or internal examiner, of course, is free to use any marking method he wishes. He can award ranks directly, or he can award the students marks out of 100, or anything else. The only requirement is that whatever method he uses, he reports to the University *only* the rank order in which his marking method places his students.)

2. The marks to be awarded to each *Rank* are determined by the University, not by the internal examiner or teacher.

(*Continue Reference No.* 1 *from page* 135)

Englehart, Max D. and Thomas, Macklin. "A procedure for transforming scores unique to part of a student population to the scale of a common examination taken by the entire student & population". *Educational Psychological Measurement*, 1953, 13, 248-263.

Gulliksen, Harold. *Theory of Mental Tests.* London, Champman & Hall, 1950.

Harper, A. E, Jr. and Misra, V. S. *Research on Examinations in India.* New Delh, National Council of Educational Research and Training, (in press).

Inter-University Board of India & Ceylon. *Examinations in Higher Education.* New Delhi, Inter-University Board of India & Ceylon, 1971.

Lindquist, E.F. (editor). *Educational Measurement.* Washington, D.C., American Council on Education, 1951. (Note that the extensively revised Second Edition of this book was edited by Robert L. Thorndike and published in 1971. But it may not yet be widely available in India.)

Mahalanobis, P. C. and Chakravarti, K. N. "Studies in educational tests. No. 3. Analysis of marks in the school leaving certificate examination in the United Provinces, India, 1919". *Sankya: The Indian Journal of Statistics*, 1934, 1, 245-266.

3. The standard by which the University decides what mark to award each rank is the external examination.[3] In technical terms, the internal assessment (expressed as Ranks in Class) is "equated" or "scaled" to the external examination marks.

Consider two class sections, A and B. On the external examination, their results are as follows:

	Section A	*Section B*
Average of marks	37%	45%
Range of marks	15%–60%	20%–70%

If Section B's external marks are higher than those of Section A, it follows that their internal marks should also be higher. So the University awards 60% marks to the student who has ranked at the top of Section A in internal assesment, as the internal assessment mark of that student; it awards the student who was ranked highest by the teacher of Section B, an internal assessment mark of 70%. In other words, the value of "Rank 1" is 60% for Section, A but in Section B it is 70%, because Section B has shown itself on the external examination to be a more able group than Section A. Similarly, the average students in the two sections will receive approximately 37% and 45% marks respectively, while the lowest will be marked 15% and 20%.

The reader may be asking, "If you are awarding the same marks on both external and internal assessment, then why bother with internal assessment at all." Remember, however, that *very few students have the same rank on two different examinations*. Every teacher who has examined his students more than once knows this. The student who tops in one examination may be 2nd, or 3rd, or even 10th in the next examination. The student who is best throughout the term—i.e. keeps up a consistently good standard, does homework on time, etc.—is not necessarily best under the pressure of the external examination. The student who topped in the external may not be the same as the one who topped in the internal. Thus *we have only specified that the average and range of the internal marks awarded to the internal Rank Orders shall be exactly the same as the average and range of external marks for those students*. Each individual student has two marks, one based on his external examination, the other on the Rank in Class awarded by his own teacher. Suppose, for example, Ram Lal has been ranked sixth by his teacher,

(3) We are making the usual assumption that the external examination marks are more objective and less biased than the internal assessment. However, this difference is only a relative one, unless the external marks themselves have previously been scaled to some common standard. Even if the external marks are not scaled, the methods described here will still improve the accuracy of the total marks. But maximum values will be obtained only if the external marks have first themselves been scaled. (See Section VII; also the Chapter on "Scaling" in Harper & Misra, *Research on Examinations in India*.)

but has topped the list in the external examination. His external mark will be the highest external mark in the class. But his internal mark will be used only on the sixth-highest external mark. Thus his final total (or average) will not give him first place—but it will not be as low as sixth, either.

As a simple example, suppose there are five students in a section, and out of a total of 100 marks, 50 marks each are awarded for internal and external assessment. The marks sheet for these five students is given in Table 12.1. (What is shown here is the first step, before final calculation of internal marks.)

TABLE 12.1

	Internal Assessment		*External*	
Student	*Rank Order*	*Marks*	*Marks*	*Total*
A	3		32	
B	5		34	
C	2		35	
D	4		31	
E	1		33	

Notice that an external mark (out of 50) has been listed for each student. But there is no internal mark, only the rank order of merit for each student. How do we find out the internal marks ? In order to be of the same "standard" the marks awarded for internal assessment are to have the same range and average as the external marks, for this particular class section. Note that the external marks for these five students range from 31 to 35, and have an average of 33. *The simplest way to ensure that the internal marks will have the same average and range as the external marks, is to use the SAME NUMBERS for both sets of marks.* The next step, therefore, is to separate the marks from the students who earned those marks, and arrange the marks in rank order, as in Table 12.2. Note that only the external marks are being arranged in rank order, not the individuals who obtained those marks.

TABLE 12.2

Marks	*Rank Order*
35	1
34	2
33	3
32	4
31	5

We can now see that Rank Order "1" has a marks value of "35", R. O. "2" is equal to "34", etc.

We can now complete the marks sheet. Look at Table 12.3. In the second column are the ranks in class assigned by the *internal* assessment examiner. For each rank, we look up the marks value of that rank in Table 12.2. For example, student A holds rank 3 in the internal assessment. The 3rd highest

TABLE 12.3

Student	*Internal Assessment Rank Order*	*Marks*	*External Marks*	*Total*
A	3	33	32	65
B	5	31	34	65
C	2	34	35	69
D	4	32	31	63
E	1	35	33	68

external mark was 33 (see Table 12.2.) Thus 33 is assigned as the internal assessment mark for Student A. Student B was considered fifth in his class by his internal examiner or teacher. The fifth highest mark assigned in the class by the external examiner (see Table 12.2) is "31". Thus "31" is assigned as the internal mark of Student B. However, his external mark was 34, so his total marks are 65.

Notice that neither the internal nor the external mark determines the order of merit in the total. Student E was first in internal, third in external, and ended up second in the final Total. Student C was more consistent, being first in one and second (rather than third like E) in the other, so he ended up with first place in the Total (69 marks). Student A, with third and fourth ranks in the two assessments, and Student B, with fifth and second ranks, ended up with a tie (65 marks each) in the final Total.

Of course, we will be doing this for a class of 60 or more, not for five. But the process is quite simple. Detailed instructions are given in Section III, for a simple method developed by the author, which can be carried out quite quickly by any intelligent clerk.

II. ADVANTAGES OF RANK ORDER SCALING

The method which we have described may be called Rank Order Scaling. Just as Fahrenheit and Centigrade thermometers have different scales, so also different examiners often use (unconsciously, usually) different scales.[4]. Just as 10 degrees Fahrenheit is very different from 10 degrees Centigrade, so also 37% marks may mean rather different things for two different examiners. And just as we can translate degrees Fahrenheit into degrees Centigrade—

(4) See A. E. Harper, Jr. and V. S. Misra, *Research on Examinations in India.* New Delhi, National Council of Educational Research and Training, (in press).

i. e. we "scale" our Fahrenheit temperature to the Centigrade standard—so, also, we "scale" one examiner's or teacher's marks to another examiner's standard. There are many ways of doing this. The method we have described uses rank orders to do it.

There are many good reasons for this procedure. After a brief technical note (addressed to experts in psychometrics and educational measurement) we will discuss those reasons which are of interest and concern to teachers, educators, and non-statisticians.

A brief technical note

There are, of course, a variety of statistical techniques available for scaling marks or scores. This is not the place for a full discussion of the subject. However, note three particular restrictions in the case where internal and external assessment marks are to be added or even compared. (a) Neither distribution can be assumed to be normal; (b) nor can we assume that the two distributions have the same shape; however (c) the resultant scaled marks are to be added or at least directly compared be being reported side by side. Under these conditions, most authorities (e. g. Lindguist, Educational Measurement) recommend the use of equi-percentile scaling. A little thought will show that the method described above will produce results which are virtually identical with those produced by crude equi-percentile scaling. If we refine equi-percentile scaling through the use of running weighted averages, smoothed graphs, etc., the results would, of course, be superior. However, when dealing with class sections of the usual size, the differences between such refined methods and the simple one described here are negligible in relation to the reliability and measurement error of the original marks involved.

Some general problems in internal assessment

1. Many Indian teachers tend to mark their students very leniently, so that when the internal assessment is added, the final totals are unrealistically high. Occasionally, an institution or an individual with very high standards will mark students unusually low, resulting in an unfair lowering of their total marks. Even when teachers are as careful and conscientious as possible, their marking standards do differ.

Unrealistically high, or unrealistically low marks *cannot* be awarded by any teacher under the Rank Order Scaling system—as teachers do not award marks at all, but only place all students in order of merit. Of course, the teacher may want to award marks at first, as a means of deciding order of merit. But since only Rank Order is reported, it does not matter how high or low the marks awarded by the teacher are.

2. Where internal assessment has been tried in India, it is often noted that the range of internal marks is extremely small. The students' marks are not spread out, so that there remains very little differentiation between the best

and the poorest student. When a small range is added to "too high" marks, the damage is compounded. Though the University may have desired 20% of the final marks to be determined by internal assessment, this is not being done. There are, in fact, two rather opposite effects: (a) It is obvious that if the highest internal mark is 20 out of 20, while the highest external is only 60 out of 80 (and if the same student should happen to top both lists), then the internal is actually 25% of the total of 80 out of 100, not 20%. (b) However, it is not generally realized that when the range is narrow, the contribution of the internal to the *position* of the student in total marks is virtually nil. Position is determined by the marks with the widest range. And if the internal assessment does not affect the student's position or rank order on the total, we might as well ignore the internal assessment altogether. (The reasons why narrowing the range of marks reduces their effect or weight are discussed in Section IV of this paper.)

Again, if we have only Rank Orders reported to the University, and if we specify that there shall not be too many tied ranks, then this "narrow range" problem is taken care of. The internal marks are automatically spread out over the same range as the external; and, when they are both on the same "scale", then the weight assigned each in the total is completely controlled by the University's statutes.

3. Under present conditions, teachers often find it difficult to assume the responsibility for giving marks to their students. They find themselves—or feel themselves—under various types of pressure to raise the marks of individual students, or of the group as a whole. Primarily, this is because teachers have traditionally had no part in determining the final mark of the student. Until there is a well-established public tradition (as there is in many countries, and is even in India up to the end of middle school) that the teacher should decide "passing and failing", and is competent to do so without inteference, the teacher may be subjected to much personal pressure to use this new power wrongly.

Asking the teacher to report only *relative* judgements (Rank Orders) relieves him of this responsibility for making *absolute* judgements (Marks), about the knowledge, ability, etc. of each student. Relative judgements are definitely more reliable than absolute judgements. Furthermore, pressures from parents and guardians are much easier to resist when only relative judgements have been made (or have been reported). For example, a teacher marks a student 31 of out 100. The parent comes and says, "Cannot you give my son just 2 more marks, so that he will pass ?" It is often very difficult for the teacher to explain or to justify not giving those extra 2 marks. On the other hand, suppose the candidate has failed because he was ranked number 49 out of a class of 60, in which 15 or so failed the external examination. In this case, the teacher can tell the parent: "I did not award your son either passing or failing marks. I just placed all the students in ranked order of merit. He was not as

good a student as the ones who were ranked 48 or higher, although he was better than those ranked 50 to 60. He was failed by the University, and I had no control over that."

4. It is the strong personal opinion of the author of this paper that the problems noted above are *not* primarily due to any lack of integrity on the part of the teachers concerned. People become trustworthy by being trusted (and vice versa), and I am convinced that most teachers will rise to the occasion. There will, however, be occasional acts of prejudicial grading for or against particular students (either consciously, or unconsciously), and some means should be found to minimize these. There is no purely statistical method to do this; and even the calculations involved in proving "probable" prejudices[5] are probably too expensive to justify their use in the usual university situation.

However, when both internal and external marks are scaled to the same standard, it is possible to spot wide discrepancies very quickly. (When they are not scaled, it is all too easy to explain away any such difference as a difference in standard.) I believe the following *should be done routinely*, under the direction of the head of each college. For each particular teacher's students, the internal and external marks (not ranks) should be written down side by side. (Translate each into the *narrower* of the two scales—e.g. if 20% is awarded for internal and 80% for external, then divide each external mark by 4, and round to the nearest whole number.) In a third column, write down the difference between the two. The teacher concerned should then be asked to justify any unusually large differences found. Unusually large differences between internal and external marks do not *prove* prejudicial grading. They may be due to a variety of other reasons. However, if there is prejudicial grading, it is not likely to be repeated if the teacher knows that the principal is making such an analysis. In extreme cases, the entire academic community may be asked to put pressure on the teacher concerned, to mend his ways.

5. The University administers examinations in a large number of subjects. Each of these subjects is taught by a large number of teachers, each of whom has a different standard of assessment and therefore must be treated separately. The University also has only limited funds for highly technical personnel and expensive machines, and therefore must

(5) Using the mean, standard deviation, and product-moment correlation of two sets of supposedly comparable marks, we can set up a regression equation to "predict" internal from external (presumably unprejudiced) marks. Those internal marks which deviate more than 2.58 standard deviations from the "predict internal" are definitely suspect, and the teacher concerned may be asked to justify the difference between his assessment and the external mark. Statistics, however, can never *prove* prejudice. Some large differences *are* justified, when educational or other non-statistical standards and values are applied.

rely as much on clerical and unskilled personnel as possible. The method proposed in this paper can be handled by clerks (with a minimum of training and supervision, *and without any machines at all.* The cost factor is, therefore, reduced to a minimum, and yet with results which will be closely comparable to those obtained by much more expensive computer processes.

III. DETAILED PROCEDURES

The following are instructions on exactly how to go about Rank Order Scaling. They are based on the situation where the University awards 20% of marks for internal and 80% for external assessment. They can easily be adapted to other allocations of marks.

Readers not interested in actually scaling a set of marks, may want to skip this section and go on to the next section, which is again of more general interest.

Instructions to Internal Examiners

These instructions will have to be prepared carefully by the University. They should be tried out on representative teachers, and re-written if they are not clear. The following are the points which must be included—though the language may have to be different from that given here.

Internal examiners do NOT submit ANY marks to the University. They only note, against the name of each student, his rank among the students they have examined.

Each internal examiner submits his own set of ranks. All the students he has examined in the same paper should be ranked together.

The entire range of rank orders must be used. The top student in the group (the one with First Position) is given a Rank Order of "1". The lowest rank order awarded is equal to the number of students ranked—e.g. if there are 63 in the group, then the lowest candidate must be given a rank of 63.

Where two or more students are tied (i.e. are considered equal) their ranks are averaged. Suppose, for example that two students are tied for fifth place. The one below them will be rank 7, since he has 6 above him. The two who are tied for fifth place therefore divide Ranks 5 and 6 between them—each is awarded the rank of 5½.

Ties should, however, be avoided as much as possible. The following rules will help. (a) No single rank should be awarded to more than 5% of the group—i. e. 3 out of a class of 60 or 5 out of 100 etc. (b) Ties should occur only among the middle range of students. If there are many ties among high-ranking, or among low-ranking students, *the examiner's method* is defective, or he is deliberately trying to falsify his results. (c) In a group of less than 100 students, not more than half the ranks should

have any ties at all, i. e. at least half of the Rank Order numbers used should be awarded to only one student each.[6]

If the internal examiner prefers to mark the papers first by ordinary methods (rather than assigning ranks directly) then he is advised to use "marks out of 100" as this will spread the students out more. He is also advised to *ignore* the usual "pass" and "division" marks , so as to avoid the tendency to pile up marks at these points. (e. g. if he awards lots of 33%, and no 32%, then there will be many more tied ranks than allowed. He will have to re-mark them, to spread them out.) He should keep in mind that, since he only reports Rank Orders anyway, there will be no such thing as a "passing mark" for the marks he awards. 33% will not necessarily pass a student, not will 32% necessarily fail him. (A simple method for quickly translating marks into ranks orders is to adapt the worksheet shown in Figure 12.3 changing column (5) to read "Average Rank.")

Instructions to clerk on how to assign Marks to Rank Order numbers

IMPORTANT: The following procedures must be carried out *separately* for the work of *each* individual internal examiner. This is because the marking standards of various examiners differ, and the level of ability of various class sections differs. The purpose of this procedures is to average out these differences, and bring them all to a common standard—i. e. the standard set by the external examination.

The sample Marks Sheet and Worksheet (see Figures 12.1 and 12.2) are based on a batch of 15 candidates. In practice, of course, the batches you deal with will be much larger. We have based the sample on 15 to simplify this explanation.

You will start with a marks sheet like the SAMPLE MARKS SHEET. In this, the ranks awarded by the internal examiner have been entered in column 2, and the marks awarded by the external examiner have been entered in column 4. Your task is to complete columns 3 and 5.

To do this you will use the WORKSHEET FOR CONVERTING RANKS TO MARKS (See Figure 12.3).

1. Fill in the blanks at the top of the Worksheet. It is particularly important that you write in "Number in group" correctly. This is the number of candidates marked by a single examiner. *Count this twice*, because you will use this number, later, to check the accuracy of your work.

(6) These rules will hold even if the examiner is using grades (A, B, C, etc.) instead of marks out of 100. This is because several different tests or examinations will be graded. Even in a single examination, several different questions will be graded. If the grade on each question is turned into a number, and they are added, a wide range of numbers will result. However, the examiner should state that he is "using grades" as some relaxation of the rule for the number of permissible ties will be necessary.

2. Glance quickly at the internal examiner's rank orders (R. O.'s). Has he followed instructions ? Is the lowest R. O. assigned equivalent to the Number in Group ? If not return the internal examiner's R. O. sheet to your Supervisor.

3. Tabulate the external Marks (column 4) from the MARKS SHEET. To do this, you make a line in the tallies column (column 2) of the WORKSHEET for each mark that appears in the MARKS SHEET. For example, Student A's mark is 48. Find 48 in column 1 of the WORKSHEET. You will find a line after it. This is the tally made by a clerk for "48". Next, note Student B's mark on the WORKSHEET, then Student C's, etc. (The large 70, 60, 50 etc. in column 1 is just to help find marks quickly, and reduce errors.)

FIGURE 12.1

SAMPLE MARKS SHEET

Internal Examiner———————————————Paper———————————

Student	*Internal Assessment*		*External Marks*	*Total*
	Rank Order	*Marks*		
1	2	3	4	5
	(Maximum marks	(20)	(80)	(100)
A	2		48	
B	8		32	
C	10½		32	
D	1		48	
E	12½		14	
F	8		17	
G	6		37	
H	10½		14	
I	15		4	
J	8		27	
K	3		58	
L	12½		21	
M	14		10	
N	5		32	
O	4		54	

FIGURE 12.2

COMPLETED MARKS SHEET

Internal Examiner———————————Paper———————————

Student	*Internal Assessment*		*External Marks*	*Total*
	Rank Order	*Marks*		
1	2	3	4	5
	(Maximum marks)	(20)	(80)	(100)
A	2	14	48	62
B	8	8	32	40
C	10½	5	32	37
D	1	15	48	63
E	12½	4	14	18
F	8	8	17	25
G	6	8	37	45
H	10½	5	14	19
I	15	1	4	5
J	8	8	27	35
K	3	12	58	70
L	12½	4	21	25
M	14	3	10	13
N	5	9	32	41
O	4	12	54	66

FIGURE 12.3

WORKSHEET FOR CONVERTING RANKS TO MARKS

Internal Examiner Ram Dass — Paper Biology II
Number in group 15 — Tabulated by Edwin Harper

External Marks	*Tallies*	*Accumulated Frequency*	*R.O. (Ranks)*	*Marks awarded each Rank*
(1)	(2)	(3)	(4)	(5)
80				20
79				20
78				20
77				19
76				19
75				19
74				19
73				18
72				18
71				18
70				18
39				10
38				10
37	1	5	5	9
36				9
35				9
34				9
33				8
32	111	8	6-7-8	8
31				8
30				8

	(1)	(2)	(3)	(4)	(5)
60	69				17
	68				17
	67				17
	66				17
	65				16
	64				16
	63				16
	62				16
	61				15
	60				15
50	59				15
	58	1	1	1	15
	57				14
	56				14
	55				14
	54	1	2	2	14
	53				13
	52				13
	51				13
	50				13
40	49				12
	48	11	4	3-4	12
	47				12
	46				12
	45				11
	44				11
	43				11
	42				11
	41				10
	40				10
20	29				7
	28				7
	27	1	9	9	7
	26				7
	25				6
	24				6
	23				6
	22				6
	21	1	10	10	5
	20				5
10	19				5
	18				5
	17	1	11	11	4
	16				4
	15				4
	14	11	13	12-13	4
	13				3
	12				3
	11				3
	10	1	14	14	3
	9				2
	8				2
	7				2
	6				2
	5				1
	4	1	15	15	1
	3				1
	2				1
	1				0
	0				0

4. Now fill in column 3, Accumulated Frequency. This is the *total* count of the number of tally marks beginning with the highest. Thus the first mark is 58 (so 1 is written in column 3), the next is 54 (so 2 is written.) There were two students who had a mark of 48, so the accumulated frequency here becomes 4 (because we add these 2 to the 2 after 54.) Complete column 3.

5. Be sure the last number in column 3 is exactly the same as "Number in group", recorded above. This is a checking procedure. *If these two numbers are NOT the same,* there is some error. Rather than try to find the error it is best to tear this worksheet in two to be sure it will not be used (but keep the parts until after re-tabulation for further checking if necessary) and tabulate on a new WORKSHEET.

6. Now complete, column 4. In this you write down all possible Rank Orders serially, beginning with "1", and going to the end. (These are NOT copies from the marks sheet. These are just numbers, written in serial order.) On each line write as many R. O. numbers in column 4 as there are tallies in column 2. In our example, the highest mark was 58, and only one candidate has this mark. He is rank 1. The next candidate had 54 marks so he is rank 2. Then R. O.'s 3 and 4 are assigned to marks 48, since two candidates had this mark. R. O. 5 goes to mark, 37, but mark 32—which was awarded to three candidate.—receives the next three rank orders, i. e. 6, 7, 8. (it may help later if you have used a different colour—say red—for the R. O.'s.)

7. Check the accuracy of your work as follows: The *last* R. O. number in *each* line in column 4 should be exactly the same as the number in column 3. (If it is not then go back and find your error and correct it before proceeding further.)

8. Column 5 on the WORKSHEET shows you what marks (out of 20) are to be assigned as internal Assessment Marks, to each rank order on the MARKS SHEET. Look at Student A on the MARKS SHEET. His R. O. (column 2) was 2. Find R. O. 2 in column 4 on the WORK-SHEET. The number after it (column 5) is 14. On the MARKS SHEET record 14 as the internal assessment marks in column 3, for Student A. (See COMPLETED MARKS SHEET.) Similarly student B's R. O. was 8. Find 8 in the WORKSHEET. The marks awarded a rank of 8 also happen to be 8 which is copied onto the MARKS SHEET. Note that 8 marks would be awarded to R. O.'s 6 and 7, also.)

In the case of 1/2 ranks, we give the student the benefit of the doubt and drop the 1/2. Half ranks occur where two, or four, students are tied for the same rank. Thus student C was tied with another student, and so was awarded a R. O. of $10\frac{1}{2}$. We find this on the WORKSHEET as R. O. 10 and award 5 marks to Student C.

9. The final step is to add internal and external marks (columns 3 and 4), and record the total in column 5 of the COMPLETED MARKS SHEET.

Instruction to University Examinations Officer

The officer and committee, in charge of examinations must, of course, remain in complete control of all parts of the process. Among other things, they need to prepare the following:

1. "Instructions to Internal Examiners" need to be prepared. An early draft should preferably be tried out on several typical examiners (particularly those in subjects where they do not deal with numbers), to be sure it is clear and unambiguous.
2. Similarly, the instructions for clerks should be tried out. Since

clerks work under the direction of the examinations officer, a training session or two can be held for them. However it is wise that they *also* have written instructions, to which they can refer in case of doubt.

3. Marks Sheet will have to be prepared with the extra columns needed for Internal Assessment Rank Order, Internal Assessment Marks and Total Marks. (See Table 12.1 and Figure 12.1.)
4. Worksheets for Converting Ranks to Marks (Figure 12.3) will have to be prepared. There will need to be as many of these as there are class sections (or individual examiners) whose marks are to be scaled. In the case where 80 is assigned as the maximum external marks and 20 as the maximum internal mark, then the Worksheet given in this booklet can be copied directly. In case the number of marks for each is different, then proceed as follows:
   (a) In column 1, write down all the external marks, beginning with the maximum and going down to 0.
   (b) In column 5, write down the internal marks equivalent of each external mark. Suppose for example, that external maximum is 100 and internal maximum is 50. Opposite 100 in column 1, you would write 50 in column 5. Obviously, internal marks in this case are 1/2 of external. So the internal equivalent of 99 external marks would be 49.5, but this also is read as 50. (Half marks are not worth the extra bother.) Opposite 98, you would write 49. And so forth, until the last line, in which 0 is wrttien in each column.

Alternative form of worksheet

The writer of this paper prefers, for his own work, a different form of tally sheet. He hesitates to introduce this, as it may lead to error if it is not clearly understood. However, once it *is* mastered, (a) it takes less space on the desk, and, more important, (b) mistakes are likely to be fewer than on the form already suggested.

This tally sheet is shown in Figure 4 with the title ALTERNATIVE WORKSHEET FOR CONVERTING RANKS TO MARKS. The general method is as already described. Familiarize yourself with that first. Then note the following points:

(a) There are ten marks in each row (across). Thus a mark of 58 is tabulated in the 8th column of row 50. There were three students marked 32. Look in row 30, column 2, and you will find three tally marks in the upper left-hand corner.
(b) Accumulated frequencies are written in the upper-hand corner of each cell. When accumulating (Step 4 in the instructions above), note that you move *from right to left*, starting at the top of the

FIGURE 12.4

ALTERNATIVE
WORKSHEET FOR CONVERTING RANKS TO MARKS

Internal Examiner _____ Paper _____
Number in group _____ Tabulated by _____

R. O.

	0	1	2	3	4	5	6	7	8	9
80	20									
60	15	15	16	16	16	16	17	17	17	17
50	13	13	13	13	14	14	14	14	15	15
40	10	10	11	11	11	11	12	12	12	12
30	8	8	8	8	9	9	9	9	10	10
20	5	5	6	6	6	6	7	7	7	7
10	3	3	3	3	4	4	4	4	5	5
0	0	0	1	1	1	1	2	2	2	2

tabulation sheet. (This is because the marks numbers go that way —80, 79, 78, 77, 76, etc.). The arrows attached to "R.O." in the upper right corner are to remind you of this.

(c) Write the R.O.'s in the center of each cell.

(d) The internal marks awarded each R.O. are pre-printed in the lower right-hand corner of each cell.

(Note to the University: If it is decided to use the alernative worksheet, instead of the earlier one, then these instructions should be re-written. They should be made complete, based on the fuller instructions given for the earlier worksheet in this paper).

IV. GENERAL DISCUSSION OF PROBLEMS INVOLVED WHEN MARKS ARE ADDED

The educational administrator must, of course, choose among several "possible methods for "scaling" or "equating" internal assessment with an external standard. Some of these may look simpler than Rank Order Scaling—some involve for more complex mathematical formulas and transformations.

The choice will be better made if the administrator understands, at least to some extent, the technical problems involved.

This section will attempt to present, *in non-technical terms,* a discussion of the various factors that affect the final marks, when two or more sets of marks are added. Though presented in non-technical language, this discussion will be based on well-established statistical and mathematical facts. The trained statistician will recognize, for himself, the general theory and principles involved. Thus, though the following are not "proofs" (which would have to be mathematical), they are *illustrations* which should make these principles clear to the non-mathematician.

What follows now is a discussion of what happens when we add marks. Most other methods take full account of only one or another of these problems, but not all of them. The Rank Order Scaling method does take account of all of the following factors. It is the contention of this writer that "simpler" methods—and even some more complex methods—leave uncontrolled certain factors which the educational administrator will, if he really understands their effect, certainly want to keep under his control. Rank Order Scaling provides a simple, inexpensive means to keep this control.

Principle 1: After determining the difference in averages between the external and internal marks, it will be found that this difference affects every internal mark.

We have put the most obvious principle first. We discuss it here, with a simple example, only for the sake of the completness of this paper.

In the example shown in Table 12.4. we suppose that two class sections have equal external marks, but different internal marks. In other words, the students in the two sections are of equal ability, but one section has a "stiff" examiner and the other section has a "lenient" examiner. To simplify the example, we are assuming that each class section has only three students and that 100 marks each are alloted for internal and external assessment.

TABLE 12.4

Section 1				*Section 2*			
Student	*Internal*	*External*	*Unadjusted Total*	*Student*	*Internal*	*External*	*Unadjusted Total*
A	60	50	110	D	45	50	95
B	50	40	90	E	35	40	75
C	40	30	70	F	25	30	55
	150	120			105	120	
Average	50	40			35	40	
Difference		−10				+5	

Note that the two class sections have equal external marks, but that the difference in internal marks makes a difference in total marks. For example, students A and D are of equal ability as shown by their external marks (50). But because one teacher is lenient and other a stiff marker, their total marks are quite different, 110 and 95. Because the teacher of Section 1 has marked "too high", and the teacher of Section 2 "too low", there is a difference of 15 marks in the total marks of students with equal external marks. i. e. students of equal ability.

The adjustment of the internal marks is made by correcting each internal mark. The correction factor is the difference in average between the two sets of marks. The marks are adjusted as shown in Table 12.5.

TABLE 12.5

Section 1

Student	*Internal*	*Correction Factor*	*Corrected Internal*	*External*	*Adjusted Total*
A	60	−10	50	50	100
B	50	−10	40	40	80
C	40	−10	30	30	60

Section 2

Student	*Internal*	*Correction Factor*	*Corrected Internal*	*External*	*Adjusted Total*
D	45	+5	50	50	100
E	35	+5	40	40	80
F	25	+5	30	30	60

After correction the three totals are equivalent for both schools just as are the external marks. Students of equal ability (i.e. with equal external marks) now have equal totals.

Principle 2: Within any one group, the ranks of candidates in the final list are determined by the relative distributions or ranges of the two sets of marks.

Actually, there are two types of situations in which we should adjust different sets of marks to a single standard. In one (which we have been discussing) we have to "equate" the results of several different groups of

students, each with a different examiner, to a single common standard. In the other situation, we have the same group of students marked on several different examinations (i. e. different papers, subjects, etc.), and we want to "equate" these different subjects. Since it is easiest to demonstrate Principle 2 in this second situation we will use the example of adding the results of two examinations for the same set of students.

To repeat, Principle 2 states that within any one group, the ranks of candidates in the final list are determined by the relative distributions (or ranges) of the two sets of marks. This can best be demonstrated with a rather extreme example. We will show how an internal examiner with ony 20 out of 100 marks at his disposal can actually control the final rank order of his students' total marks. In other words, he can control who gets the highest total, who is second who gets the lowest total, etc.

Suppose that 20 marks are to be awarded on the basis of internal assesment, and 80 marks are based on the external examination. It would be natural to expect that the ranks of the students in the total (100 marks) would be determined primarily by the external examination.

TABLE 12.6

Student	*Internal*		*External*		*Total*	
	Marks	*Rank*	*Marks*	*Rank*	*Mark*	*Runk*
(Maximum)	(20)		(80)		(100)	
G	13	(1)	55	(3)	68	(1)
H	7	(2)	60	(2)	67	(2)
I	1	(3)	65	(1)	66	(3)

In Table 12.6, Student I had the highest external mark, 65. But he had the lowest internal mark 1 and also the lowest total, 66. In general, the rank order of the students in the total is the same as their rank in internal (with 20 marks maximum)—and *opposite* to their rank in the external (in spite of its 80 marks maximum). Furthermore, note that this reversal has happened in spite of the fact that the external examiner was much more lenient than the internal—his lowest mark (55) is 69 %, higher than the internal's highest (13=65%). Yet it was the internal mark which controlled the position of each student in the Total.

Of course, this case is made extreme to demonstrate the point. In practice, the external examiner is unlikely to confine his range of marks between only 55 and 65. However, to *some* extent the internal examiner can *always* have more than a 20% influence (which is what the University apparently wants him to have, when it allows him to award 20% of the total marks')

just by using a wider range of marks. For example, in most subjects, marks on the external examination are likely to range from 20% to 70% (or 16 to 56 out of 80). If the internal examiner doubles this range (i. e. uses a range of marks from 0 to 20) he will have the same effect on his students' rank orders in the Total as he would have had if he had been allowed 33 marks (and the external examiner only 67 (marks) rather than only 20. (This follows from a formula which will be given later.)

The above example also makes it evident that just adjusting for the difference in *average* marks (as is done in several places in India is not enough to counteract this effect of the *range*. This can be made clearer by another example. (See Table 12.7.) To simplify it, we will suppose that two sections have only two candidates each. One of these candidates gets 70% on the external examination and the other gets 30%. The results are the same for both sections—each has students of equal ability.

TABLE 12.7

	Section 1				*Section* 2		
Student	*Internal*	*External*	*Total*	*Student*	*Internal*	*External*	*Total*
J	80%	70%	75%	L	60%	70%	65%
K	20%	30%	25%	M	40%	30%	35%
	100	100	100		100	100	100
Average	50%	50%	50%		50%	50%	50%

Student J and L both received 70% marks on the same external examination. But J received 80% marks from his internal examiner, while L received only 60%. The case of students K and M is similar, except that it is reversed—the examiner who was "too lenient" with J is "too stiff" with k, and vice versa for L and M. Notice that the teacher of Section 1 wanted a distinction for one student, but didn't care if the other failed; while the teacher of Section 2 wanted every student to pass, even if none received a distinction. Adjusting only the averages would make no difference, since the average for both sections is the same (50%). Obviously, the *range* of marks must also be adjusted, if this sort of manipulation by the teacher is to be avoided. In other words, the first teacher's top mark must be lowered and his bottom mark raised—and vice versa for the second teacher. No adjustment on the basis of average marks will do this. The adjustment must take account of the range of marks. Rank Order Scaling corrects simultaneously for *both* the average and the range.

Principle 3: The distribution or range of the total marks is determined by the ranges of each set of marks and the correlation—the degree of relationship—between them.

Thus far (to keep the explanations simple) we have acted as though the top

student in the internal examination will also achieve the top mark in the external examination; and that the bottom mark will go to the same student in both exams. In practice, we know that this is seldom true. The same student—unless he is far above any of his classmates—seldom tops in two examinations in succession. We now study the effect of this fact.

To simplify our discussion, we shall take the range between highest and lowest mark as a rough measure of the distribution. (In actual work it is another statistic, the "standard deviation", which is usually used to obtain accurate results.) Also, we will simplify matters by discussing, separately, only three degrees of correlation or relationship.

Principle 3(a): If the rank orders of the two sets of marks agree completely, the distribution (range) of the total will be the sum of two ranges.

TABLE 12.8

Student	*Internal*	*External*	*Total*
N	75	70	145
O	60	60	120
P	45	50	95
Q	20	40	60
Range	20–75	40–70	60–145
	=55	=30	=85

As we can see from Table 12.8 the range of the total is the sum of the two ranges: 55+30=85

Principle 3(b): If the rank orders of the two sets of marks disagree completely, (i. e. are in reverse order), the range of the Total marks will be the difference between the two ranges.

Let us illustrate this with the same set of marks as in Table 12.8. Look at Table 12.9.

TABLE 12.9

Student	*Internal*	*External*	*Total*
R	75	40	115
S	60	50	110
T	45	60	105
U	20	70	90
Range	20–75	40–70	90–115
	=55	=30	=25

As we can see, when the marks go in exactly opposite directions, the range of the total is the difference between the two ranges; 55-30=25.

It follows from this that if the two ranges are equal (and the marks are in opposite orders) the range of total marks will be 0. This is made clear in Table 12.10.

TABLE 12.10

Student	*Internal*	*External*	*Total*
V	75	30	105
W	60	45	105
X	45	60	105
Y	30	75	105

Principle 3(c): When the relationship (correlation) between the two distributions is zero (i. e. they neither agree nor disagree), the distribution of the totals will be the square root of the sum of the squares of the two distributions.

This cannot be illustrated simply, as the other Principles could be. It is mentioned here only for the sake of completness in this presentation.

Of course, there are many degrees of correlation (relationship) between perfect correlation and zero, and between zero and perfect disagreement. The ranges or distributions of total scores can be determined for these by the mathematical formula given below.

$$\sigma_t = \sqrt{\sigma_1^2 + \sigma_2^2 + 2\sigma_1 \sigma_2 r_{12}}$$

where σ_t is the standard deviation of the two marks
(i.e. of the total marks)
σ_1 is the standard deviation of the first set of marks
(e. g. the internal marks)
is the standard deviation of the second set of marks
(e. g. the external marks)
r_{12} is the coefficient of correlation between the two sets of marks.

The mathematically inclined reader will note that Principles 3(a), 3(b), and 3(c) are derived directly from this formula.

Principle 4: The larger the number of test and examination marks that are added together (for the same class section), the smaller will be the range of the average of those marks.

This follows directly from Principle 3. We know that *no* two sets of test or examination marks are perfectly correlated—let alone three, or four, or five. (Even when students repeat the *same* objective tests, or essay examination,

the marks of most of them differ the two times.) Since the same student is seldom at the top in all tests, the highest average is nearly *always* less than the highest mark in any single examination.

Here is a rather artificial example. We assume that the *top five* students in a large class are all of approximately equal ability, so that the same one never gets the top mark twice. Table 12.11 gives their results on a series of five tests. After each, in parentheses, is the average of the tests he has taken so far.

TABLE 12.11

Student	*First test*	*Second test*	*Third test*	*Fourth test*	*Fifth test*
A	75	73 (74)	71 (73)	69 (72)	67 (71)
B	67	75 (71)	73 (72)	71 (72)	69 (71)
C	73	71 (72)	69 (71)	67 (70)	75 (71)
D	69	67 (68)	75 (70)	73 (71)	71 (71)
E	71	69 (70)	67 (69)	75 (71)	73 (71)
Highest Average	(75)	(74)	(73)	(72)	(71)

Notice how the highest average of two tests (74) is less than of one test (75); how the highest average of three tests (73) is less than of two; etc. In a large class, the same sort of thing will also happen to the bottom students—except that, in their case (since they are at the bottom, and the same student is not lowest all the time) each new average will be *higher* than the one before. Thus the range narrows, as we add together the results of more and more examinations. (This is why there can never be so many first divisioners in the aggregate high school or university marks, as there are in each separate subject.)

If the University receives marks (instead of rank orders) from the colleges, this effect becomes serious. The best colleges will base their marks on the results of several tests and examinations, the lazy ones on only one. But the result will be that (other things being equal) the range of marks from the best colleges will be less than those of the weakest colleges—and therefore the better the college, the *less* will be its influence on the final total marks of of its students! Therefore a way of correcting for this effect is presented later (see Section VI).

Notice that even when only two sets of marks are added, the effect of Principles 3 and 4 can be quite serious. If the correlation is low (and it often is) it means that the proportion of first divisioners will be substantially *reduced*, and the proportion of passes will be substantially *raised*. In other words, those above the average will get lower marks than they should, and those below the average will get higher marks than they would have if only the external (or only the internal) marks had been counted. Incidentally, in

practice this is what happens when the marks of two papers are combined into a single total. (See Section VI for a fuller discussion and a simple method to correct for this effect.)

Principle 5: When two sets of marks are added, the shapes of the distributions affect each student's mark (though not his rank), and the refore determine the weight that each test carries in the total marks.

When we talk of the "shape" of the distribution, we are imagining a graph of the marks. For example, one examiner "bunches up" his marks at the top; another "bunches them up" at the bottom. In most classes (though perhaps not in all) the "bunching up" should be about in the middle, with only a few very high or very low.

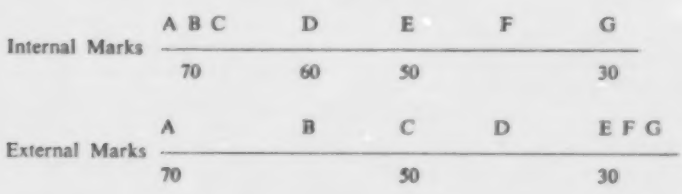
Let us again take an absurd example and also, to simplify it, assume a perfect rank order relationship between the first and the second set of marks for seven students. This is shown in Table 12.12. Internal and external are supposed to have 100 marks each.

TABLE 12.12

Student	*Internal Marks*	*External Marks*	*Total Marks*
A	70	70	140
B	68	60	128
C	66	50	116
D	60	40	100
E	50	34	84
F	40	32	72
G	30	30	60

The distribution of marks in Table 12.12 will be clearer if we graph them. The graph looks as in figure 12.5.

FIGURE 12.5



Notice that the internal examiner has awarded fourmarks (all close together) above 50, and only two (spread out) below. The external examiner has done the opposite—only two spread out marks about 50, with four bunches

together below. What is the effect of the different shapes of these two distributions of marks? Well, for Student A, internal (70) and external (70) each counts 50% or one-half of his total marks of 140. But look at Student D. Internal marks are counted 60% of his total of 100, and external marks only 40%. In fact, for all students except A and G, the internal marks count as more than half (i. e. more than 50%) of the total. Obviously, the internal examiner has been allowed to have much more influence than he is supposed to have, on his students' final marks.

In practice, of course, two sets of marks do not have exactly the same rank orders. The marks are all mixed up. When the University says that internal and external shall count 50% each, this can be true only *on the average*. For most individual students, of course, one or the other will count more than 50%, and the other less. But the problem is this: Unless the shapes of the two distribution of marks are identical, then the average 50:50 weighting will not exist in all parts of the distribution (i.e. equally for high, middle, and low marks). At some levels—in some classes or divisions, perhaps—almost all the marks will be influenced more by one examiner than by the other.

The effect of the shape of the distribution becomes even more serious when two or more different groups of students, with different examiners, are involved. The mark of a particular student from the group may be higher or lower than that of a student of equal ability from the other group, just because his examiner has used a peculiarly shaped distribution for the marks he has awarded. When the marks of all the students are listed together, without regard for who the examiner of each was, the resulting unfairness is obvious.

Summary of effects

In summarizing the above, we find that Principle 1 applies *only* when the results of two or more groups are to be equalized. It is not necessary to apply it when we are adding up marks for a single group of students—e. g. adding the marks of several subjects to obtain an aggregate. The reasons for this is that the average difference affects all students equally, so any changes or adjustment of the average have no effect at all on the rank orders of the students in total marks. (If this is not clear to you, don't worry. It is stated here only for those who may want to extend their thinking beyond the limits of this paper. Understanding it is not essential to the problem of adding internal and external marks.) In this case, only Principles 2, 3, 4 and 5 apply. Because Principles 2, 3, and 4 are interrelated, but Principle 1 is independent of any of them, we may now summarize as follows:

> **General Principle I: Where the marks of only one group of examinees are involved, the distribution of total marks, and the relative weight carried by each part, depends on the relative sizes and shapes of the two or more distributions, the correlations between the sets of marks, and the number**

of sets of marks added. Within a single group,the difference between the averages of the two or more sets of marks has no effect on the relative weights of the parts in determining ranks in the total.

General Principal II: When the results of two or more groups (and examiners) are involved, then, in addition to relative distributions and correlations, the difference in averages between the two sets of marks must also be taken into account.

(It may be noted, in passing, that these same principles apply when more than just two sets of marks are added. Thus they do not only apply to the problem of internal vs. external assessment—*they apply whenever test or examination marks are added,* for any purpose whatsoever. However, they become more complex as the number of sets of marks increases.)

V. APPLICATION OF GENERAL PRINCIPLES TO RANK ORDER SCALING

The justification for our method of Rank Order Scaling, for the adding of internal and external assessment marks, should now be quite obvious. Since we use a directly proportional set of numbers for both internal and external marks[7], the average (Principle), range (Principle 2), and shape (Principle 5) of the internal and external marks is identical.

If only the average is adjusted, then Principles 2 and 5 are still allowed to affect total marks in uncontrolled ways.

If only mean and standard deviation are adjusted (the standrd score method), then Principle 5 may (and often does) still affect total marks in uncontrolled ways.

This leaves only Principles 3 and 4 uncontrolled by the Rank Order Scaling method presented. These Principles are also usually uncontrolled when the standard score method is used. They can be controlled in that method, but the addition of *r* greatly complicates the formulae, so it is usually left out. In the next section we wlll show how a simple extension of the Rank Order Method will care for these problems, too.

VI. EXTENSION OF RANK ORDER SCALING IN THE LIGHT OF PRINCIPLES THREE AND FOUR

In the usual situation where internal and external assessment marks are added (especially when only 20% of marks are awarded for internal

(7) They would be *exactly* the same if the University allowed the same number of marks for both internal and external assessment—which, perhaps, is the minimum ideal towards which we should be working. But to be practical have based this paper on the more usual situation, i.e. that each individual's external mark is matched by an internal mark which is directly proportional to it, an internal mark which is 1/4 of the external mark.

assessment) the effects of Principles 3 (correlation) and 4 (reduction of range through adding) are probably negligible. However, (case 1) if colleges submit several different assessments which are separately scaled and added by the University, or (case 2) if it is found that the correlation between internal and external assessment varies widely from college to college, then a further adjustment may be advisable.

In the first of these cases, two separate scaling operations should be carried out. Suppose, for example, each college is to submit the results of three different examinations (first, second and third term), and that the total of these is to be added in with the external marks. The proper procedure is as follows:

a. Each separate set of internal marks is scaled to the same scale. This scale may be the external marks, or it may be any other convenient scale.
b. The three scaled internal marks are added, to determine the "internal total".
c. This "internal marks total" itself must then be scaled to the external marks, before adding internal and external. The reason for this is that the range of the "internal total" (a sum or average of three marks) will be less than that of the single external mark (Principle 4). Therefore (Principle 2) it will carry less than the prescribed weight in the total, unless it is re-scaled to the external marks scale.

In case the colleges have submitted three sets of rank orders rather than marks, it is still necessary to scale each set separately, before adding. Average rank orders should not be used. In statistical terms, this is because marks are "linear" (or, at least, they are supposed to be) while rank orders are "non-linear". This means that in, say, a class of 100, the difference between ranks 1 and 2 is usually much greater than the difference between ranks 51 and 52, who are in the middle. The difference between ranks 99 and 100 will also usually be much larger than that between 51 and 52. Any experienced teacher, or examiner, will know this to be true. If we average the ranks then we dilute the advantage that should go to the student who has ranked first on at least one test even if he is not first on all of them.

The second case mentioned above may be, in some ways, more serious. It follows from Principle 3, that the lower the correlation between the two sets of marks, the smaller will be the range of the total or average. A low correlation between internal and external assessment can result from many factors. It may be due to carelessness or even deliberate falsification on the

(8) Occasionally, if the same teacher or examiner is involved and he is quite consistent in his marking, then this is not required. A quick check, would be to count the number in the highest class or division (Distinction, First, or Second) and the number of failures. If these remain relatively constant for the several sets of marks, then rescaling is not needed.

part of the internal exminer. But it may equally be due to much greater carefulness on the part of the internal than of the external examiner—i.e. a much greater reliability of internal marks, for example because they are based on several tests and examinations rather than only one. Again, the external assessment is usually, a test of memory for information crammed at the last moment. The internal assessment may give much greater importance to consistent effort, depth and breadth of understanding (rather than memory), etc. If we consider these factors desirable, then it follows that the results from a superior institution may correlate *less* with the external examination than those from an inferior institution which relies only on a single traditional test of memory and cramming.

And, if this happens, then the scaled marks of the superior institution will carry *less* weight in the total for those students than the scaled marks of the inferior institution (See Principle 3). In other words, because the range will be more reduced for the superior than for the inferior institution's students' total marks, it will seldom be possible for those of the superior institution actually to top the list.

The solution to this problem is to scale each set of marks add them up then re-scale this total—i. e. "expand" this distribution to the size of the original external marks distribution.

It is easiest to illustrate this with a case where internal and external marks are both based on 100 marks and the total is the average of the two. (Where external is 80% of marks then all we have to do is to multiply each external mark by 5/4 to obtain the correct scale for total.)

In the COMPLETED MARKS SHEET—EXTENDED METHOD given in Figure 12.6 we have arranged the students in order of their external marks. This is jus' to make it easier for you to see what happens in the scaling process. In actual practice of course the students would be arranged in order of registration or alphabetical order or some other non-marks order.

FIGURE 12.6

COMPLETED MARKS SHEET—EXTENDED METHOD

Student	*Scaled Internal Marks*	*External*		*Sum*			*Scaled Average*
		Marks	*Rank Orders*	*Marks*	*(Ave.)*	*Rank orders*	
1	2	3	4	5	6	7	8
E	18	70	1	88	(44)	5.5	52
L	35	66	2	101	(50.5)	4	62
J	62	63	3	125	(62.5)	2	66
B	66	62	4	128	(64)	1	70
A	19	52	5	71	(35.5)	10.5	30
K	30	45	6	75	(37.5)	8	37

1	2	3	4	5	6	7	8
C	63	40	7	103	(51.5)	3	63
N	45	37	8	82	(41)	7	40
H	37	35	9	72	(36)	9	35
M	25	30	10	55	(27.5)	12	19
D	5	25	11	30	(15)	14	13
I	52	19	12	71	(35.5)	10.5	30
O	70	18	13	88	(44)	5.5	52
F	13	13	14	26	(13)	15	5
G	40	5	15	45	(22.5)	13	18
Range:	5–70	5–70		13–64			5–70

The essence of the method is that the external marks (columns 3 and 4) *provide the scale BOTH for the internal marks and for the scaled average.*

1. Columns 3 and 4 are the equivalent of the WORKSHEET FOR CONVERTING RANKS TO MARKS shown in Figure 3. These columns are the external marks and rank order.

2. The scaled internal marks (column 2) are obtained as described in the previous instructions for column 3 of the SAMPLE MARKS SHEET. (See Figure 1) They are based on the marks scale shown in column 3 here.

3. The next step is to add the scaled internal and external marks. The totals are recorded in column 5.

4. Now, against each sum (total marks) in column 5 write its rank order (column 7). (For the moment ignore column 6.) The highest sum is marked "1", the second highest "2" etc. As before, tie ranks are averaged. For example there are 4 marks above a mark of 88 but there are two 88's. Therefore 88 shares rank orders 5 and 6. Averaging these each of the two 88's are ranked 5.5 (or 5½).

5. Now, use columns 4 and 3 to convert each rank order in column 7 to its proper mark. Write these marks in column 8. For example, candidate B ranked first with a sum total of 128 marks. The number of marks awarded rank order 1 can be seen from columns 4 and 3 to be 70. (Remember that, as previously discussed, we separate "marks" from "students" for this stage of scaling. In actual practice, with a large group, you would use the WORKSHEET FOR CONVERTING RANKS TO MARKS, rather than writing in column 4 on the Marks Sheet). Thus a scaled average of 70 is awarded to Student B. As was described in the previous instructions, in case of ties you give the candidate "the benefit of the doubt" by dropping half ranks. Thus both candidates E and O (ranks 5.5) receive the marks of rank order 5. If you wanted to be super-exact, you might take the scaled marks of ranks 5 and 6—i. e. 52 and 45—and divide these between the two 5.5 candidates, awarding them each 48.5 marks. But this is not really worth the trouble. (a) In a large group, the difference will not be more than a mark or two;

and (b) the errors of measurement in essay-type examinations are so large anyway, that this source of further error would be quite negligible.

Column 6 has been included just to simplify showing you the effect of this extension of our basic Rank Order Scaling procedure. This is the average marks (unscaled)—i. e. the sum divided by two. Compare columns 2, 3, and 6. The highest mark in both columns 2 and 3 (internal and external marks) is 70. But the highest unscaled average (column 6) is only 64. Similarly, the lowest internal and external mark is 5, in each case. But the lowest unscaled average is 13. Thus the effect of Principle 3 has been to lower high marks, raise low marks, and reduce the range by 14 point, from a total of 65 to 51 marks, when two sets of marks are added and averaged. Our extension of the Rank Order Scaling method has expanded this range, again, to the original total of 65 points (column 8). of course, with a large class and marks closer together, this effect is likely to be smaller than shown here. However, in many cases it will not be negligible. Furthermore, it will vary from college to college (or from examiner to examiner), with the range most restricted for those with the lowest correlation between the two sets of examination results.

VII. OTHER APPLICATIONS OF RANK ORDER SCALING

We have described Rank Order Scaling in a particular context. However, it is obvious that it is not limited to that context. The reader will be able to make his own applications, but perhaps just a few hints may be helpful.

In the first place let it be noted that Rank Order Scaling is adapted best to small groups. The larger the group, (a) the more cumbersome is the process of ranking, and (b) conversely, the more efficient becomes the equi-percentile method. Remember that the two achieve virtually identical results; but when you have a group large enough to use equi-percentile scaling, you have the added advantage that you can use smoothed curves for greater accuracy.

We have talked of 20 marks internal and 80 marks external. Any other split can be used—50 marks each, 100 marks internal and 40 external, or anything else. The tables and charts can be very simply adapted.

We have talked of "combining" marks. Many experts in India believe that internal and external marks should not be combined, but should be reported separately. The need for scaling is still there, and the method remains the same.

We have used the external examiner's marks as the "standard". This is not necessary. Any arbitrary standard can be used—the average of the distributions of several examiners, an arbitrary distribution set up by the University, etc. In this case, both the internal *and* the external marks need to be scaled, to the common standard.

We have talked about internal and external examiners—but the same method can be used to reduce the marks of several external examiners to the same common scale. This is justifiable, of course, only when we can assume that all examiners have received the same distribution of good and poor quality answer books. (And if they have not, then *no* marks submitted by them are scientifically justifiable anyway.) This can be done by the "randomization" methods developed at Gauhati University. Then each examiner can be asked to place in rank order even as many as 300 scripts. The University would have a series of tables, from which it could read off the marks value of any particular rank out of totals of 310, 305, 300, 295, 290 etc. scripts. It should be noted, however, that Rank Order Scaling is more time-consuming than the traditional mean and standard deviation method, in such large groups, (It is much quicker than the standard method in small groups.) If the distributions are seriously skewed, it is worth doing—but if they are close to normal, then use mean and standard deviation in this last instance.

A POST SCRIPT

Since completing this paper there has come to our attention an article by Dr. Norman France entitled, "Evaluation in High School: Fact or Fiction." This was originally published in *Education Canada* but has been reprinted in India in *CENBOSEC News & Views*, March 1972 of the Central Board of Secondary Education, New Delhi. Dr. France argues that the ranking of the student by the class teacher, who knows him best, is far more valid than any external examination can possibly be. Thus the sudent's mark should depend entirely on the rank given him by his teacher. To determine the marks value of that rank, Dr. France proposes that all candidates take "a common 'reference' test consisting of multiple choice items designed to test the ability to reason in a wide-ranging content drawn from all subject areas. Individual scores would not be revealed to students or teachers but would be...used merely to quantify the ranking already provided by the teacher." Thus the range of marks in each class section is determined by this common "reference" test. If available, a computer can carry out the matching of marks to ranks, although the simple clerical methods proposed above are equally relevant to Dr. France's paper.

We can adapt Dr. France's proposal to India by using the present external examinations as the "reference" tests. The external marks would thus be used *only* for scaling the internal assessment. This means that a student's external mark would neither be reported, nor would it be combined with his internal mark. His "internal" mark would be his final mark. Thus the external examination would only set the "standard" by determining the mark awarded to each rank. The student's own mark would be determined by the rank given him by his class teacher, without any reference to his mark on the external examination.

However, Dr. France's "common reference test" proposal does have one enormous advantage over the above adaptation. This would reduce public examinations from the present one month, to one day only. Not only would the final mark awarded be more valid—25 teaching days (or 25 days of vacation) would be added to the school year!

Grades or Numerical Marks?

WALKER H. HILL

Like any deeply ingrained aspect of culture, grading and marking practices involve motivations that are only partly accessible to examination at the conscious level, and are correspondingly resistant to change. Before practices can be made psychometrically more sound, their bases must be brought out and subjected to conscious, even self-conscious scrutiny. Since many, perhaps most, of the issues relating to the assignment of marks are issues of value, an examination of marking practices must address itself first and foremost to a clarification of these values (*Thorndike and Hagen*, 1969; *pp.* 586-587).

It is clear that the marking system used for university examinations, in India is a deeply ingrained aspect of the culture. Indeed, the current system is so familiar, so much a matter of custom, that few teachers or students in universities and colleges have ever considered that any alternative way of marking might be proposed.

I believe there is a better way.

In discussing this problem, I shall do so with reference to university examinations at the undergraduate level in the Indian setting.

I. CRITERIA FOR A MARKING SYSTEM

It is fair to ask: By what criteria should one kind of marking system be judged to be better than another ? The criteria that I consider important are:

1. The marks should indicate, as accurately as possible. the level of academic achievement of the students who are marked.
2. The meaning of the marks should be clear to students and to others who are concerned about their standing. (These others include teachers, parents, and those who may make decisions about a student's eligibility for employment or for post-graduate study.)
3. It should be reasonably easy to calculate the marks without a need to use expensive equipment or elaborate statistical procedures.

The marking system that is familiar in India uses numerical marks. Students are marked on each examination paper on a scale from 0 to 100,

though the full scale is seldom used. Each student's mark is intended to be a measure of the quality of his answers. A student's marks on different papers are combined to give his aggregate mark for all of his subjects. Then, an evaluation, as distinct from a measurement, is applied to the aggregate mark. If the mark is as high as 60% of the possible total, the student is said to be in the first division; otherwise, his mark is in the second or third division, or he has failed.

How may this marking system be judged with reference to the three criteria which I have mentioned ?

Accuracy

On the first criterion it fails badly. It provides a very *inaccurate* measurement. There are many reasons for this, a few of which may be mentioned.

1. The standards of examiners differ widely. Our ordinary experience would tell us that this is likely. Research tells us that it is a fact. We have found that judgements of examiners are significantly different even when they are marking equivalent sets of answer books—even when different examiners have marked the same individual answer book. (Harper, 1967; Taylor, 1963a). We want a student's mark to depend on the quality of his answers more than it depends on which examiner happened to mark his answers. To be confident that this goal is realised, it is necessary to scale the marks of examiners to a common standard.

Scaling can be done in a variety of ways. Two methods which I would suggest as most worthy of consideration are what I call the Gauhati method (Taylor 1963b and Misra 1969, 1971) and the Dandekar method (Dandekar 1968).

2. Examiners frequently distort their results by indulging in evaluation as well as measurement. That is they decide who shall pass and who shall fail. If the passing mark is 35, they give an unusual number of marks of 35 and very few (perhaps not any) marks of 34 or 33. Similar bunching may be found at the minimum marks for first and second divisions. Sometimes it appears *below* the minimum for first division, examiners seeming to be reluctant to give either a failure or a first to borderline cases.

3. In some subjects (e. g., Mathematics) the highest mark awarded may be 100 and the lowest close to 0. In other subjects this never happens. The highest mark may be 70 and the lowest mark 20. Thus for what is said to be a 100-mark paper, the actual range of marks is 50. When the marks of different papers are added, the subject in which a wide range of marks is used has more effect on the total result than does the subject with a narrow range. In order to be comparable, the marks need to be scaled before they are added.

Familiarity

With reference to our second criterion the present marking system has much to be said in its favour, and also a good deal to be said against it. It is

familiar to all concerned. It does have meaning not only in the educational system, but also to the public, while the meaning of any alternative marking system would have to be learned. Yet much of its familiar meaning is false. It is looked upon as a fixed and dependable standard which it is not.

Marks on a 100-point scale are apt to be misleading because they make us think we know more about the students than we really do know. In the eyes of the public—and of many educators who ought to know better—one whose examination mark is 60 is a better student than one whose mark is 59, and surely better than one whose mark is 55. A university goes so far as to place one of these students in the first division and the others in second division.

This view assumes that marks are awarded on an absolute scale and that the marks are free or error. Neither of these assumptions is justified.

It is supposed that a student's mark indicates that he has a known proportion of a known quantity of knowledge. If his mark on a Physics paper is 35, it means that his ability has been appraised at 35 per cent. It is 35% of what ? Of the entire body of knowledge in Physics ? Of that part of the subject which is represented by the syllabus ? Either way, an affirmative answer would be nonsense. There is no absolute scale. We can only say that the student has exhibited 35% of some particular individual's impressionistic judgement of what students ought to know.

A student's mark has real meaning only as a number to compare with the numbers assigned to others students. Furthermore, these numbers are *estimates*, and they are subject to error. In all examination results there is a standard error of measurement which, can be calculated. Dr. H. J. Taylor (1963a) who has made such calculations for many examinations, has said that for examinations in India this error is normally about five marks, and often as high as seven. According to the University Grants Commission (1973) "for some typical papers set at universities...statistical analysis has shown that when an examiner assigns a mark to a script there is a 50 per cent chance that his error is greater than 5 per cent. If, then, we consider our three students whose marks are 60, 59, and 55, what do we really know about them? We are not sure of a mark of 60; at best we can be confident only that the mark should be between 55 and 65—and that range might include the true marks of all three students since the one who has awarded 55 might have a true mark as high as 60." "Under these circumstances," the UGC (1973) continues "the 101 point scale loses all its significance."

I would conclude that the advantage of familiarity is offset by the serious misconceptions that are inevitably involved in the familiar system. I have often heard it argued that the old marking system should be retained because it is familiar. Perhaps this is an even stronger argument for changing it.

Simplicity

Considering the third of our criteria the present marking system meets

it quite well. Indeed it may be said to conform to this criterion *too well*. The usual procedures are too simple; they are easier than they ought to be. I have already given some indication of what I mean. The marks of examiners are used for comparsion when they are not comparable. They are not scaled to a common standard. Raw marks (i. e., unscaled) are added though they come from disparate distribution of marks. In short the procedures are so simplified that they ignore essential safeguards.

It may seem anomalous to say that the treatment of marks is oversimplified, when we must recognise that the whole process of assigning, recording, checking, and tabulating marks is so laborious and time-consuming that the announcement of results is delayed far beyond what the students, the universities, and the public should be willing to tolerate. In all of this, we depend too much on human labour. I say "too much" because it is costly, it is prone to error, and it takes too much time. Some of this work could be done to better advantage if it were mechanised, and there is equipment available in India to do it.

But that is not what this criterion means. It means, for example, that when scaling of marks is proposed, we must ask whether it is too complex a procedure to be practical. I am convinced that it is not.

II. FROM NUMERICAL MARKS TO GRADES

I do not propose that we abandon numerical marks. They are useful. My criticism is that in the present system they are misused. I believe the marking system should be changed so that marks are used properly.

Numerical marks should be the beginning of the marking procedure, but they should not be its end. I mean that examiners should mark papers just as they have been doing but that other procedures should be added before examination results are declared. The final report of results would not be in the form of numerical marks.

One procedure should be introduced before the answer books are given to examiners. The answer books should be thoroughly randomised. This ensures that all examiners are marking sets of answer books that are equivalent in quality. Each examiner has both good ones and bad ones; each set is no better or worse than any other set. Then we can be reasonably sure that differences in the marks of examiners may be attributed to their different standards of marking, not to differences in the abilities of the students. Also the identity of the student and of his college should be removed from each answer book. These should not be known to the examiners.

If one examiner marks his books from a high of 80 to a low of 30, while another marks his from 60 to 20—and such a difference is not uncommon—it is unfair to students when the marks are allowed to stand. The two sets of marks should be scaled to a common standard, and the unfairness is eliminated. Then the difference between one examiner's 80 and the other's 60

becomes unimportant. Both would probably agree that these are the best papers, and that is what we want to know.

Marks are important, but they are important for just one purpose: to determine the rank orders of the students. This is the function of the examiner, this and no other. The examiner's mark need not to be the final mark. I wish to emphasise, as strongly as I can, following the principles:

1. The examiner's function is to determine the relative quality of answers, to decide how the students' papers should be ranked in order of merit.
2. It should *not* be the examiner's function to determine the final mark of any student. That determination should be made by the university.
3. It should *not* be the examiner's function to decide whether any student passes or fails. That decision should be made by the university.

There are several possible ways, as I have suggested, of randomising answer books and scaling marks. I would recommend the Gauhati method of randomising (See Chapter 10). For scaling, I prefer the method described by Prof. Dandekar (See Chapter 11) because it avoids what seems to be a flaw in the Gauhati scaling procedure and because it can lead directly to a system of grading.

To show how the Dandekar method of scaling would work, we may construct an illustration as at Table 13.1

TABLE 13.1

AN ILLUSTRATIVE DISTRIBUTION OF MARKS

Percentage of Candidates	*Range of Marks*
1	2
2	80 and above
8	70-79
10	63–69
14	59-62
16	55-58
20	50-54
10	45-49
10	40-44
10	39 and below

In this table the first column represents a *decision* that the entire range of marks shall be divided into nine groups and that each group shall contain the indicated percentage of students. The decision is based on other factors which will be explained latter, but let us assume for the moment that it has been made as shown in this table.

The second column is determined *empirically*. It is based on the actual marks awarded in the particular subject in the last three years.[1] All the

1. A period of three years is suggested as a reasonable base. Of course, a university could use a period of four or five years if it wished to establish an even more stable base.

answer books for each year are arranged in the rank order of their marks, from highest to lowest, and a tabulation of the marks for each year is made. The distributions for the three years are then combined to form the standard scale. Then the range of marks for each group of students (in column 1) is entered in the table (column 2). This table shows that 2% of the students had marks of 80 or above, the next 8% had marks of 70 to 79, etc.

Once the table has been prepared, it becomes the standard. It need not be used by the individual examiners; let them mark as they choose. The standard can be applied by the university. As each examiner's set of answer books is returned to the university, his books should be arranged in rank order, and then the books are re-marked to fit the standard scale, which is only a clerical procedure.

The result is that a uniform standard of marking is applied to all students who have written the examination. No student suffers because of the disparate standards of examiners.

The normative standard should be kept up to date. This may be done by revising it each year, adding the latest year's marks and discarding the marks of the earliest year. Thus the standard scale is always based on data for the most recent three, year period.

Should the same standard scale be used for all subjects ? As we turn to the matter of grading, we shall see that the first column represents the university's decision about the desirable distribution of grades. This distribution should be the same (or approximately so) for all subjects. The range of marks for the grade levels will be different in different subjects. It is empirically determined, and we know that in some subjects we shall not find any marks above 80. Yet in these subjects (e. g., in History as well as in Mathematics) some students should receive the top grades.

From the scale of marks it is a simple matter to develop a scale of grades. Let us add a few more columns, as shown in Table 13.2.

TABLE 13.2

TRANSFORMATION FROM MARKS TO GRADES

Per cent of Candidates	*Range of Marks*	*Numerical Grade*	*Letter Grade*	*Description*
1	2	3	4	5
2	80 and above	9	A1	Very Good
8	70-79	8	A2	
10	63-69	7	B1	Above Average
14	59-62	6	B2	
16	55-58	5	C1	Average
20	50-54	4	C2	
10	45-49	3	D1	Below Average
10	40-44	2	D2	
10	39 and below	1	F	Fail

I am following quite closely a table developed by Prof. Barrow (1971) which is based on the proposal of Prof. Dandekar. The letter grades are the symbols to be used in the announcement of examination results. This scale of grades, together with the descriptive terms (column 5), is what students and the public would need to learn. In those countries in which numerical marks have commonly been replaced by grades, this has not been a large problem; the scale of grades, quickly became familiar.

These grades would be assigned for each paper in the examination. The numerical grades (column 3) are needed if we wish to combine the grades for different papers. They can easily be averaged, and then the corresponding letter grade may be assigned to the aggregate.

Using a 100-mark scale (actually 101, since it includes 0), we are attempting to make distinctions that are too fine. In view of the error involved, these distinctions are not meaningful. The advantage of the grading scale is that we do not attempt to use such a large number of categories. With only nine grades, each representing a *range* of marks, we have a more dependable differentiation among the students.

It is fair to ask why we should choose to use nine grades. Why not more, or fewer ? The decision is necessarily somewhat arbitrary. To use nine categories is definitely better than using 101. But nine is not a magic number. In the United States the most commonly used grading scale includes only five categories. A similar scale has been proposed for Indian universities by Prof. Srinivasan (1971). It is used by the Indian Institute of Technology and the Agricultural Universities, and it is now advocated by the University Grants Commission.

It should be emphasised that I do not claim that the figures in Table 13.2 are necessarily the one which ought to be used. I have called it an *illustrative* distribution of grades, presented to show how such a scale could be developed. Our attention should be focused on the first column. This, as I have said must represent the university's decision. It is a decision, first, about what proportion of the students should pass the examination (numerical grades 2-9). This table shows 90%, which is much higher than occurs under the present marking system—as I think it ought to be. The university should adjust this percentage as it deems proper.

Column 1 represents, next, a decision about the proportions who shall attain the various grade levels. It may be noted that the distribution shown here is not quite symmetrical; there are a few more students at the above-average grades. I have deliberately made it that way. Some will argue, however, that the distribution should be symmetrical, should follow a "normal" curve. This would mean that there are the same numbers of students above and below the average, the same numbers at the top and bottom of the scale. These different views could be debated at great length. Such a debate should occur in India, but not in this paper. The discussion would involve such

questions as (1) whether the students taking an examination are to be considered a normal or a selected population and (2) what kind of distribution is culturally (or politically) most appropriate. My own preference is based in part on a desire to demonstrate to students that the grading system is skewed (though but slightly) in their favour.

In order to make clear that the scale depicted in Table 13.2 is by no means the only kind of scale that might be adopted, let us examine some alternative schemes. Table 13.3 combines a number of variations. The distribution in column 1 still includes nine grade levels, but notice that it now represents a normal distribution. This particular distribution is known as *stanines* ("standard nines"), and it is widely used.

TABLE 13.3

AN ALTERNATIVE GRADING SCALE

Per cent of Candidates	*Range of Marks*	*Numerical Grade*	*Letter Grade*	*Points per Credit Hour*
1	2	3	4	5
4		9	A	4.0
7	To	8	AB	3.5
12		7	B	3.0
17	be	6	BC	2.5
20		5	C	2.0
17	deter-	4	CD	1.5
12		3	D	1.0
7	mined	2	DE	0.5
4		1	E	0.0

Column 4 shows a scale of letter grades suggested by Dr. Edwin Harper[2] which is quite realistic in that it explicitly recognises error of measurement. When a student gets A, we are sure his true mark justifies the A grade, while AB means that he is near the borderline; his true mark might be at either the A or B level. This scale is used by a few universities and colleges in some countries.

Column 5 is a set of numerical grade equivalents which can be used in a scheme which I shall suggest for combining grades for different papers and in different subjects.

Since the University Grants Commission is advocating a 5-point scale of grades, this may be the pattern which will prevail. We should, therefore,

2. A. Edwin Harper, Jr., All-India Seminar on Examination Reform, Jammu, February 1974.

examine a scale of this kind. Table 13.4 is a variation of the one proposed by the UGC (1973).

TABLE 13.4

A FIVE-POINT GRADING SCALE

Per cent of Candidates	*Numerical Grade*	*Letter Grade*
1	2	3
7	5 or 4	A
24	4 or 3	B
38	3 to 2	C
24	2 to 1	D
7	1 to 0	E or F

We may note that the UGC proposes a numerical scale from 1 to 5, with 1 at the top. (It is the highest grade.) I am sure this would be confusing; who will understand that the lowest number represents the highest grade ? Therefore I have reversed the scale, which seems to me more likely to gain public understanding and acceptance.

The alternative figures and letters which I have shown in columns 2 and 3 refer to an issue which needs to be considered carefully. The UGC recommends that there should be no failing grade; therefore its scale does not include O. (No letter grades are given in the UGC table.) "In this system of grading," we are told, "there is no question of failure which is an archaical concept" (UGC, 1973). This pronouncement is at least questionable. If there is to be no failure on any examination, then it is essential that a scheme of grade-point averages be adopted, if for no other reason, in order to determine which students should be awarded the degree.

For this purpose, the scale of grade is supplemented by another scale, since papers and courses are not weighted equally. The "credits" for a course will depend on the amount of work it requires. Thus, a course which involves five hours per week in class and or laboratory gives more credit than one which involves only three hours (or which runs for fewer weeks). As used in the Agricultural Universities, the scale of grade-points runs from 4 to 0. A student's record for a course is the product of his grade-points and the number of credits allotted to the course. If his grade is A for a 5-hour course, he has $4 \times 5 = 20$ points. When he has completed 20 credits and his grades give him 65 points, he has a grade-point average of 3.25. Whether or not there is a failing grade, a university might insist that each student have an average of at least 2.00 (of a possible 4.00) in order to graduate.

We have seen that a number of different grading scales are both possible and defensible. Whatever scale is adopted, the university must decide what distribution of grades it considers appropriate. Then it should continue to use the distribution upon which it has decided. The grade distribution is a kind of "academic currency," which should retain a generally stable value. Adjustments may be made, however, if and when the university has solid evidence from other sources (not from examinations) that the general ability level of its students has changed.

III. SOME ISSUES

In considering the possibility of adopting a new grading system, there are issues which ought to be faced. We have discussed some of them already.

Are the procedures of scaling marks and translating them into grades too technical, too complex, to be workable? I have stated my view that they are not. No statistical expertise is required to develop and use a grading scale.

When a marking system has long been familiar and accepted, is it wise to change to something new ? I have suggested that there are so many defects in the old system that it is difficult to justify its retention. Its very familiarity is to some degree a disadvantage. Too much of what is generally known about it is not true.

Must students be marked on an absolute scale, or is a relative scale defensible? It is comforting to believe that our marking is based on a fixed standard. But I think we have to face the fact that an absolute standard is an illusion. To act as if it were a reality is to deceive ourselves and—what is worse—deceive the public. That is what we do when we say that any fixed numbers of marks is required for passing an examination. No university has evidence that a mark of 35 on this year's examination is equivalent to last year's 35. Universities do, in fact, depart at times from their "fixed" standard. If the number of students who fail is too large, the marks are "moderated."

If the passing mark is 35, and it is attained by significantly fewer students this year than last, what is the explanation? Either this year's students are less able, or this year's examination is more difficult. The latter is much more likely to be the true reason.

In my judgement, we have no recourse but to recognise that grades must be assigned on a relative basis. If this is true, let us recognise it frankly and openly. The question then is: Relative to what ? Relative to a "reasonable expectation" of how well students ought to perform on an examination ? Who is to judge what is reasonable ? We know that those who actually do the judging (the examiners) do not agree.

The best answer is to say that students should be judged in relation to their peers. In the scheme that I have suggested, their peers are the many hundreds of students who have written the examination in the last three years.

It is important that the standard be based on the performance of large numbers of students. There is very little difference in the ability of such large groups from year to year. This is a dependable standard; it has a high degree of stability.

I am sure there will be objection to any system of grading like those suggested here, on the ground that it permits students themselves to determine the basis for judgement of their performance on examinations. A relative standard, it will be said, is really no standard at all. Whether students do well or poorly, the same distribution of grades will be applied. Some critics will anticipate that students will deliberately slacken their effort when they know that each student's grade will be relative to the performance of other students; by agreement among themselves they can lower the standard. The answer to this is that it will not happen. Only an inconceivable degree of students organisation and control could prevent students from attempting to "bear the system" by writing good papers to gain high marks in relation to the low standard presumed to be set by other students.

If a university should desire to change from numerical marking to grading, how could it accomplish the change without encountering massive resistance? Some college teachers have said that adoption of a grading system is desirable, but one university cannot do it alone. While it is not possible for some pioneering changes to be introduced by single universities, it may be more advantageous for a group of universities, perhaps those in a region, to think about such a problem together, reach an agreement, and act together. Perhaps it is possible for the change to be made on an all-India basis. This is what the University Grants Commission (1973) seems to be hoping—"it is most appropriate that the grade system is uniformly adopted in all our examinations in the country."

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Abolishing Pass and Fail in Public Examinations

SALAMATULLAH

The Central Board of Secondary Education has recently taken a decision to declare the results of the Higher Secondary Examination without mentioning whether one has passed or failed. Instead, the Board proposes to show the grades secured by a candidate in different subjects in the certificate awarded to him. This is an extraordinary decision regarding a public examination in a country like ours where success and quality of performance in such an examination have acquired a status which is almost sacrosanct to the public mind. This announcement came as a shock to a lot of people. Even the intelligentsia and the elite seem to have their own misgivings about the proposed measure. Further, this is apt to agitate the mind of employers for whom classification of students into 'pass' and 'fail' has been providing an automatic screening procedure. This is bound to have a direct impact on universities and other institutions of higher learning not only because it will directly impinge on their admission policies, but also because it is likely to have its repercussions on their own examination practices.

I

But is there any justification for so much concern about the proposal to abolish the practice of designating persons as successful or failures in an examination? It is really surprising that the public, and, particularly, the educated section of it, have such a pathetic faith in the sanctity of the examination result, inspite of everybody knowing how this result is influenced by extraneous factors, such as the use of corrupt practices and unfair means, let alone the intrinsic deficiencies like the lack of reliability and validity in the examination itself. The assumption underlying this faith is that the one who passes and the one who fails really belong to two different categories in terms of ability and potentiality, and that the examination does separate one from the other as well as the wheat is separated from the chaff. But this assumption is unwarranted because ability is a continuum, with no sharp division between the two groups of the capable and the incapable, between those who pass and those who fail. Such a clearcut division is unfair and

improper for two main reasons: (1) that it is humanly impossible to make a firm distinction between the border line cases, however ingenious and refined the tool or the test may be, and (2) that a country needs a wider range of a given ability and a larger variety of abilities for its development. Therefore, to fail a large number of students may be tantamount to perpetration of injustice on the one hand and curtailment of human resources for national development on the other.

Moreover, fixing of the minimum pass-mark is an arbitrary arrangement. This is evident from the fact that different examining bodies have fixed varying percentages of pass marks for various examinations. Then, there is no rhyme or reason why a particular mark should be regarded as the cut-off score to determine success in an examination. The concept of pass-mark serves only to confuse many of the real issues concerning education and employment.

Apart from the unreliability of marking, the value of unit mark varies from paper to paper, subject to subject and from year to year for the same examination. Several studies have shown that significant fluctuations in the mean and standard deviation as well as in the percentage of passes occur in all subjects. These fluctuations are too large to be explained as being due to the probable error of marking alone. Assuming the improbability of any sudden changes in the average intelligence or in the standard of education where a large number of students are involved, the fluctuations are most probably due to the changes in the value of unit mark or in the standard of the questions, or of both. If that is so, it is, all the more, unreasonable to sum up marks obtained in different subjects, and more so in optional subjects, for declaring 'pass' or 'fail' and for assigning a division or a class on the basis of the total. All these classifications vary from one examination to another which is largely accidental.

To make the confusion worse confounded, one more accentuating factor enters into the process of marking, when a minimum pass mark is fixed in advance. As it is, the examiner cannot predetermine the difficulty value of the examination questions. So what actually happens in marking a paper is that he consciously or unconsciously goes on adjusting his scoring so that an arbitrarily predetermined proportion of candidates will 'pass' and obtain various divisions, irrespective of the percentage value at which the pass mark and marks for different divisions are set. Thus, a revision in the standard of marking goes on while the examiner is checking the answer books, with the obvious lacuna that all the answer books are not evaluated on the same basis, and therefore, do not get comparable marks. Thus, in fixing percentage of marks for "pass" or various divisions arbitrarily, we are only deluding ourselves to no particular advantage. The percent system is supposed to set absolute standards and to result in comparable scores. But, as we have already discussed, it is far from being true.

II

The new proposal of the Central Board of Secondary Education seeks to overcome some of the defects pointed out above. The proposal is to be implemented in May, 1975 beginning with class IX which will take the High School Examination in 1977 according to the '10+2' pattern. The examination result will show grades rather than numerical marks obtained by a candidate in each subject. Of course, the scripts will be initially examined in terms of marks. Then, these marks will be converted into standard scores in order to make them comparable, and finally transformed into five grades: A, B, C, D and E on the principle of normal distribution, a distribution which can be justifiably assumed in this case because it involves a large number of unselected candidates. There will be no over-all grade or division for the aggregate of all the subjects a candidate has offered, and no question of success or failure.

In such a scheme of grading, there is no predetermined absolute percentage of marks for declaring one to have passed or to have been placed in a certain division or class, as is the case at present. Here one's grade in a subject is determined in relation to the distribution of marks over the total population of students appearing in the examination for that subject. Thus, the grade shows one's relative position in a given subject with reference to the whole group.

This scheme has another advantage over the present practice. Here the proportions of candidates obtaining different grades remain stable, while in the present practice, the pass percentage and the percentages of candidates securing various divisions are entirely arbitrary, as is quite evident from the results of all public examinations.

One more advantage accruing from this scheme is that it will substantially reduce over-crowding in educational institutions which occurs on account of re-admission of a large number of failures in the present system. In case, one wants to improve his grade, he can do so through self-study or correspondence course.

III

There are two problems which any public examination has to meet. One of these is how it can be used to select or classify candidates for further education or for courses leading to a vocation or profession. The other is related to employment, that is, in what manner the examination results can be utilized in recruiting candidates for various jobs. So far as admission to a course for further education of the liberal or vocational type is concerned, the grades secured by a candidate in various subjects can form a rational basis for selection or guidance. Similarly, an employing agency while making

selection for a job may give due weightage to the grades obtained by the candidates in those subjects which are relevant to that job.

Now the question is whether it is desirable to introduce this scheme in the university examinations. It will certainly be a wiser step to implement the scheme in the first degree examinations, particularly in the affiliating and federal type of universities where the number of candidates is rather large. This will have the same advantages at this stage as have been described above. But in respect of post-graduate and professional courses where the numbers involved are smaller and courses of studies are more specific, such a scheme may be redundant. Firstly, these courses attract only selected students of high ability for specialized training and theoretically it may be easier to decide the cut-off point. Secondly, the performance of such students cannot be graded on the lines suggested above, because they are a select group and as such their scores in the examination will not be normally distributed. Thirdly, these students being in small number, their performance can be evaluated more accurately even in terms of numerical marks.

IV

To sum up, failure of students and repetition of courses should be regarded a crude educational practice. The failure of students should be taken as a failure of the institution, its teachers, curriculum and instruction, which call for improvement.

Anatomy of Unfair Means in University Examinations

H. S. SINGHA

I. THE CONTEXT

Every year, during certain months, the universities are haunted by the abominable monster of malpractices in examinations. It comes in the guise of materials hidden on the students' persons, smuggling of answer books in and out of the examination hall, outright dictation of answers on loudspeakers, attacks on invigilators, a medical certificate and subsequent shifting of the seat to a hospital and umpteen other forms. Notwithstanding the sensation it creates, we have to ask a number of questions about it. Is it a fact or just fiction ? How big is the problem of unfair means ? What is the extent of violence used during examinations ? The least that can be done is to size up the issue in all its ramifications and to discover if there is any 'method in madness'. This is precisely what the present paper purports to do.

Definition

What is meant by malpractices in examinations ? What means are considered unfair ? Even if there appears to be no semantic confusion, answers to these questions are really elusive—lest as they do on the thin edge of social acceptability. The ultimate aim of candidates who sit in the examination is to secure marks as high as possible. Only when the means adopted for the purpose deviate from accepted social norms they become unfair. The difference between fair and unfair is as tenuous as between honest and dishonest behaviour. Take the example of guessing the expected questions for examinations and resorting to selective or eliminative study. This recognized way of preparing for the present examinations is seldom questioned. Similarly, if a student presents a point of view in his answer just to impress the examiner regardless of his own convictions, his method would possibly pass the test of social acceptability. So is the case with students writing around the topic when not sure of the answer. These subtle ways would rather go under the respectable *rubric* of 'test wiseness'. To avoid these difficulties we would take examination to be a game and if it is played according to rules, it is played

well. These rules are many times laid down specifically by the universities.[1] *Accordingly, unfair means in examinations would imply the organized or unorganized defiance of university rules in the process of taking examinations.*

It may be noted that this need not be confined only to students. This definance may be resorted to by various people in a variety of ways. Depending upon the person who indulges in them we may have unfair means by students and those by non-students like: teachers, parents and others.

We may also classify unfair means into 'simple' and 'non-simple' categories. Simple cases are those which are unplanned and individual. They are indulged in on the spur of the moment because of some mental strain or prevailing atmosphere. They are also non-repititive in character. Checking up answers to questions with the help of fellow students or passing on other information through verbal communication are clear illustrations of simple unfair means. In non-simple cases, however, the fraud is planned in advance and carried out according to that plan. The intention to cheat exists prior to the occasion for cheating and generally more than one person is involved in the fraud. Possession of materials and mass copying would easily fall under this category. Both the simple and non-simple cases are criminal in nature the difference between them being the same as between culpable homicide and cold blooded murder—the latter naturally calling forth more stringent punishment.

The unfair means in university examinations may also be conveniently classified according to the time at which they are indulged in, yielding three main categories: unfair means before the actual conduct of examinations like impersonation and leakage of papers, those during the conduct of examination like copying with the help of materials or persons (including mass copying) and those after the conduct of examination like chasing the examiners for increase in marks or manipulation in the examination office. In this paper we shall be following, by and large, this scheme of classification.

Consequences of unfair means

The banefulness of unfair means in the examinations is self obvious. They make examinations technically worthless, reduce learning to a frustrating experience and prove socially disastrous. As a consequence of them, the examination marks which are supposed to be the indicators of scholastic achievement become meaningless entities. The difference between two students getting 40 and 60 marks may not be due to the difference in their inherent ability or understanding of the subject matter but may simply be due to their ingenuity and resourcefulness in beating the examination system. The extraneous factors introduced by unfair means invalidate the whole process of testing. Not only this, unfair means have a serious backwash effect on the

1. Kashmir University, in their statutes, has drawn the most comprehensive list of activities which would be deemed as unfair in examinations.

process of teaching and learning in the universities. Examinations are recognized as a strong mobilising force in education. They provide a strong stimulus to educational effort affecting the teachers, students and even the universities. This motivating force of examinations depends upon, besides other things, the knowledge that they would be conducted fairly and honestly. There cannot be a greater setback to this force than the impression among the students and teachers that examinations would not be conducted honestly and that there are other ways of achieving success than hard work. Furthermore, unfair means in examinations do not cripple only the education system but also destroy the very democratic fabric of our society. As a consequence of the malpractices, the distinction between competence and incomptence becomes more difficult to discern and the principles of equality of opportunity and social justice, which are essential ingredients of democracy as we understand it, are observed only in their violation. Will this not bring abut all-round inefficiency and wastage of putting people in positions by virtue of wrong labels they get through detestable means ? Thus the malpractices in examinations prove cancerous both educationally and socially.

Concern about unfair means

The above mentioned serious consequences justifiably make unfair means in examinations a serious matter of profound public concern. The Government of India were seized of the problem as back as May 1970 when, on the recommendation made by the Central Advisory Board of Education, a Committee on Examinations was set up "to examine the present situation and make recommendations to counteract malpractices and to give protection to invigilators and others concerned with examinations" (NCERT, 1971). The Committee studies the problem in great detail and made wide ranging recommendations concerning legislative measures like empowering the examining authorities to check students and prohibit those with weapons, making the indulgence in malpractices by employees and authorities of the universities a cognizable offence, and educational measures like improving the conduct of examinations and de-emphasizing the use of examination results for recruitment or admission. They even recommended that maximum age for appointment for clerical posts be reduced to 19 years and admission to colleges be on the basis of entrance examinations. To gauge the problem at the school stage, the National Council of Educational Research and Training took up a survey of unfair means in the examinations conducted by the State Boards of School Education. A few isolated studies were also undertaken by individuals here and there. But much remained to be done, particularly in respect of the university examinations. In order to fill this gap, the Association of Indian Universities undertook, in the beginning of 1974, a comprehensive survey of unfair means in undergraduate examinations conducted during the year 1972-73. It was conducted through a questionnaire developed with the help of Delhi University and sent to all the universities by post. The response was

quite encouraging with 34 main-stream universities sending replies. Major findings of the analysis of responses are being presented in this paper.

The survey was focused only on the undergraduate stage with the understanding that this stage, because of the sheer large numbers involved, is the most important for policy oriented research. It was designed to assess the extent of the problem; to discover if there is any relationship between the extent of unfair means and the size of a university in terms of the number of examinees; to study the inter-faculty variability; to identify the various types of unfair means and to indicate the level of violence. The survey was not, however, aimed at testing any hypothesis. It was rather designed to generate hypotheses and provoke further research on the topic. Moreover, it was only diagnostic in nature and no aetiology could possibly be attempted. Causes of unfair means can at best be only guessed as is being done in a latter section of the paper. The investigation also suffered from the limitation of dealing only with the unfair means resorted to by the students and ignoring, so to say, those by non-students. Even among the unfair means by students, cognizance was taken only of the cases reported to the universities. Under-detection and under-reportage being imponderable variables cause a serious handicap in the appraisal of unfair means. This problem is particularly serious in case of unfair means before and after the actual conduct of examinations, for which reason the picture regarding them would, at the most, remain hazy.

In fact unfair means in examinations is like an iceberg with greater proportion of it being hidden from the view. The findings in the paper should therefore be read and interpreted with the proviso that we might be touching only the tip of the iceberg.

II. UNFAIR MEANS BEFORE THE EXAMINATION

It may be remarked at the outset that arrangements for examinations require a considerable administrative effort on the part of the universities. Even innocuous operations like inviting applications, sorting them out, issuing roll numbers and assigning students to various centres may give opportunity to the students to use unfair means. Setting, printing, storage and distribution of question papers is the most straining for the examination offices and needs utmost care as any leakage of question papers even at a few centres invalidates that particular examination throughout the university. Two of the important types of malpractices which the universities have, therefore, to contend with before the actual conduct of examination are impersonation by students and leakage of question papers. From the responses received from the universities, it appears that there are very few malpractices other than these two. One university has reported that pilferage of answer books for the purposes of writing the answers to expected questions with a view to inserting them later in the answer books is sometimes resorted to by the students before the examination. Another university has reported false

representation in the admission form as one of the other malpractices prevalent before the examinations. The mis-representative may relate to giving false information about a previous examination or about date of birth. Writing on the walls of the examination hall or on benches before the commencement of examination as also arranging with outsiders to supply answers on smuggled answer books or additional sheets have also been reported. Nonetheless, no quantitative measures of these unfair means are available.

Impersonation

The position regarding impersonation is given in Table 15.1. Out of 34 reporting universities only 7 have reported some cases of impersonation—the maximum number of reported cases in a university being 4. As the number of cases detected will be a function of the incidence of impersonation and the efficiency of the examination branch to detect it, Table 15.1 indicates that either the incidence of impersonation or the efficiency of the university machinery for detecting it is very low. *If we assume that university examination offices are reasonably efficient in detecting impersonation then a safe conclusion could be that the incidence has certainly not reached an alarming proportion yet.*

TABLE 15.1

IMPERSONATION IN THE UNDER GRADUATE EXAMINATIONS DURING 1972-73

Sl. No.	*University*	*No. of cases of impersonation*
1.	Andhra	1
2.	Baroda M.S.	2
3.	Guru Nanak	3
4.	Karnatak	2
5.	Mysore	3
6.	Panjab	4
7.	Sardar Patel	2
8.	Others*	0
	Total	17

1Universities of Agra, Allahabad, B.H.U., Bangalore, Berhampur, Bhopal, Dibrugarh, Gauhati, Jiwaji, Jodhpur, Kanpur, Kashmir, Kurukshetra, Madurai, Mithila, Nagpur, Poona, Punjabi, Rajasthan, Ranchi, Saughar, Saurashtra, Shivaji, South Gujarat, Sri Venkateswara, Udaipur and Visva-Bharati have reported no cases of impersonation in 1972-73 examinations.

Leakage of question papers

The business of question paper setting seems to be well managed on the whole. Leakage has been reported only in two universities. In Karnatak University two papers were leaked and the members of the board of paper setters were thought to be the source of leakage. In Mysore University a few

question papers were tampered with at one of the examination centres. They were subsequently replaced and re-examination was arranged. Considering that thousands of question papers are being handled by the universities, these two cases are not a serious reflection on the management of examinations in India.

III. UNFAIR MEANS AT THE EXAMINATIONS

The conduct of examinations represents the climax of the process of testing in the universities. It is at this stage that the interaction between the students and the system of examinations becomes maximum. Naturally we should expect maximum number of unfair means at this stage. This is more than proved by the present survey, as will be seen in what follows.

Extent and pattern

Table 15.2 describes precisely and quantitatively a situation which is otherwise well-known viz. that *the malpractices in examinations is a universal problem.* It gives the extent of unfair of means during actual conduct of examinations in the form of an index as the number of unfair means cases per thousand students registered with the universities. Only in Visva-Bharati University which is a special type of university is the index zero while its maximum value is 48.04 in Ranchi University. The national or over-all index comes to 10.09 which is not a gratifying figure. This implies that for about 97 students who were registered for examinations during 1972-73 one student was alleged to have used unfair means. The index is less than 5 in the universities of: Andhra, Bangalore, Baroda, Dibrugarh, Gauhati, Jodhpur, Karnatak, Madurai, Mysore, Poona, Sardar Patel, Shivaji, South Gujarat, Udaipur and Visva-Bharati. It is more than 20 in the universities of: Guru Nanak, Kanpur, Mithila, Panjab and Ranchi. The frequency distribution of universities over the index is given in Table 15.3. There is a clear-cut concentration of universities at the lower end of the index with the number of universities decreasing as we move up the index.

Relation between unfair means and number of examinees

It may be natural to expect the number of unfair means cases to increase or decrease with the number of students registered for examinations. In the present study, the rank order correlation co-efficient between the two comes to 0.63. But that really does not take us far. What is important from the point of view of university governance is to know whether the number of unfair means cases increases at an increasing rate. The rank-order correlation coefficient between the index of unfair means and the number of undergraduate examinees in the university comes to 0.04 which is too small to stand any tests of significance. It appears, therefore that there is no linear relationship

TABLE 15.2

EXTENT OF REPORTED UNFAIR MEANS (UFM) CASES IN UNDERGRADUATE EXAMINATIONS HELD DURING 1972-73 IN THE MAINSTREAM UNIVERSITIES

Sl.No.	*University*	*No. of students registered*	*No. of UFM cases reported*	*No. of UFM cases per 1000 students registered*
0	1	2	3	4
1.	Agra	67,953	859	12.64
2.	Allahabad	16,214	106	6.54
3.	Andhra	91,717	396	4.32
4.	B. H. U.	3,425	30	8.76
5.	Bangalore	35,182	36	1.02
6.	Baroda, M. S.	23,012	16	0.69
7.	Berhampur	9,038	85	9.40
8.	Bhopal	23,175	292	12.59
9.	Dibrugarh	11,628	57	4.90
10.	Gauhati	27,710	124	4.47
11.	Guru Nanak	50,504	1,437	28.45
12.	Jiwaji	25,327	378	14.92
13.	Jodhpur	8,405	31	3.69
14.	Kanpur	70,996	1,431	20.16
15.	Karnatak	97,077	182	1.87
16.	Kashmir	17,442	239	13.70
17.	Kurukshetra	6,790	43	6.33
18.	Madurai	1,13,384	139	1.23
19.	Mithila	17,359	622	35.83
20.	Mysore	1,17,175	237	2.02
21.	Nagpur	1,07,004	1,972	18.43
22.	Panjab	1,55,822	3,714	23.83
23.	Poona	1,39,226	241	1.73
24.	Punjabi	47,263	673	14.24
25.	Rajasthan	95,502	602	6.30
26.	Ranchi	32,454	1,559	48.04
27.	Sardar Patel	13,732	26	1.89
28.	Saugar	23,006	288	12.52
29.	Saurashtra	50,536	260	5.14
30.	Shivaji	66,828	231	3.46
31.	South Gujarat	33,322	51	1.53
32.	Sri Venkateswara	43,110	262	6.08
33.	Udaipur	6,452	16	2.48
34.	Visva-Bharati	478	0	0.00
	Overall	16,48,248	16,635	10.09

TABLE 15.3

DISTRIBUTION OF MAINSTREAM UNIVERSITIES OVER THE INDEX OF UNFAIR MEANS (AS THE NUMBER OF UFM CASES REPORTED FOR EVERY 1000 STUDENTS REGISTERED FOR EXAMINATIONS).

Index	*No. of Universities*	*Commulative frequency*	*Percentage Commulative frequency*
Below 5	15	15	44.12
5–10	7	22	64.71
10–15	6	28	82.35
15–20	1	29	85.29
20–25	2	31	91.18
25–30	1	32	94.12
above 30	2	34	100.00

between them. Goodman and Kruskal's-Co-efficient and the classical[2] test also clearly establish that the index of unfair means and the number of examinees handled by a university are not dependent on each other. This has an implication that we cannot take administrative unmanageability of university enrolments as an alibi for unfair means. We have to look elsewhere. We may even go to the extent of saying that *unfair means in university examinations is not an administrative problem; its causes as well as the remedies will have to be non-administrative in nature.* This is not to say that we can afford to be complacent as far as university administration is concerned. It has naturally to be streamlined to meet increasing complexities more than to control the use of unfair means in examinations.

Inter-faculty variation

What is the inter-faculty variation in the incidence of unfair means ? Are unfair means more predominantly prevalent in a particular faculty than in others ? For this purpose the university faculties are divided into three major groups: (i) Arts and Humanities including Commerce; (ii) Science, and (iii) Professional faculties like Medicine, Engineering, Law, Education etc. Table 15.4 gives the faculty-wise analysis of malpractices in different universities. The overall index of unfair means for the Arts and Humanities is 11.34 and it ranges in various universities from 0.00 to 49.04. In the Sciences the overall index is 7.83 and it varies from 0.00 to 52.63. In the Professional faculties overall index is 6.75 while it varies from 0.00 to 42.20 in various universities. It may also be observed that in the Arts and Humanities the index is less than 5 in 15 of the reporting universities, one of them having it zero. In the Professional faculties 25 universities have it less than 5 and 6 of

TABLE 15.4

INTER-FACULTY VARIATION OF THE INCIDENCE OF UNFAIR MEANS IN THE UNDERGRADUATE EXAMINATIONS OF 1972-73

Sl.No.	*University*	*Index of UFM for the arts and Humanities*	*Index of UFM for the Sciences*	*Index of UFM the Professional Faculties*
	1	2	3	4
1.	Agra	13.75	12.30	7.15
2.	Allahabad	4.53	3.56	16.75
3.	Andhra	5.55	2.42	0.00
4.	B. H. U.	12.68	3.91	0.31
5.	Bangalore	0.35	1.10	2.50
6.	Baroda. M. S.	0.83	0.34	0.65
7.	Berhampur	12.15	9.27	0.00
8.	Bhopal*	17.17	10.92	4.80
9.	Dibrugarh	4.56	6.37	4.09
10.	Gauhati	4.19	5.98	3.80
11.	Guru Nanak*	32.00	14.92	1.37
12	Jiwaji	15.82	7.02	39.44
13.	Jodhpur	2.99	7.16	1.10
14.	Kanpur*	21.01	23.11	14.85
15.	Karnatak	1.59	2.68	2.36
16.	Kashmir	10.67	20.41	0.00
17.	Kurukshetra	12.73	21.58	4.07
18.	Madurai	1.33	1.19	0.13
19.	Mithila	29.73	48.06	0.00
20.	Mysore	2.01	2.51	1.20
21.	Nagpur	21.39	14.63	4.27
22.	Panjab	23.21	14.47	42.29
23.	Poona	1.74	1.74	1.65
24.	Punjabi	15.36	8.28	9.69
25.	Rajasthan*	6.02	7.27	5.95
26.	Ranchi	49.04	52.63	33.38
27.	Sardar Patel	2.84	0.97	0.83
28.	Saugar	12.58	12.72	12.14
29.	Saurashtra	5.76	5.15	1.74
30.	Shivaji	3.45	4.06	1.23
31.	South Gujarat	1.03	3.52	0.98
32.	Sri Venkateswara	6.69	8.24	0.00
33.	Udaipur	1.93	3.77	2.08
34.	Visva-Bharati	0.00	0.00	0.00
	Overall	11 34	7.83	6.76

*Mass copying cases proportionately distributed.

them have the index as zero. The study of inter-faculty differences in the index of unfair means through "sign Test" also yields interesting results. The

difference between the incidence of unfair means in the faculties of Arts and Humanities including Commerce and those of Sciences does not come out to be significant at 5% level. However, the incidence in the Professional faculties comes out to be significantly less than in the other two groups of faculties. Although the latter result is consistent with the general notion about the incidence of malpractices in different faculties, the former seems to violate it.

Types of unfair means

A clear picture regarding the types of unfair means used by students emerges if we classify them as :

1. Copying from Materials including the intention to do so even if unsuccessful;
2. Copying with the help of other persons including mass copying which necessarily depends on the involvement of other persons; and
3. Other types of unfair means like smuggling of answer books and anything that human ingenuity might devise.

The incidence of these types as reported by the universities is shown in Table 15.5. *It appears that the real villain of the piece is copying from materials.* The overall percentage of copying with the help of materials comes to 66.6. Only in 4 universities does the percentage of cases alleged to have used materials falls below this overall percentage. In 13 universities it is hundred percent. The overall percentage of cases using unfair means with the help of other persons in 28.3. In most cases where copying with the help of other persons is reported, it is generally a case of mass copying which is easily the number two in importance as the type of unfair means used by students. Cases other than these two types are really very rare. The overall percentage in this case is just 5.1. It appears that students are yet to learn other methods of beating the actual conduct of examinations.

TABLE 15.5

TYPES OF UNFAIR MEANS USED IN THE UNDERGRADUATE EXAMINATIONS DURING 1972-73

Sl.No.	*University*	*Percentage of cases copying from materials*	*Percentage of cases copying with the help of other persons*	*Percentage of other cases*
	1	2	3	4
1.	Agra	100.0	0.0	0.0
2.	Allahabad	100.0	0.0	0.0
3.	Andhra	94.4	5.6	0.0
4.	B. H. U.	100.0	0.0	0.0

	1	2	3	4
5.	Bangalore	94.4	0.0	5.6
6.	Baroda, M. S.	100.0	0.0	0.0
7.	Berhampur	100.0	0.0	0.0
8.	Bhopal	94.5	5.5*	0.0
9.	Dibrugarh	94.7	0.0	5.3
10.	Gauhati	N.A.	N.A.	N.A.
11.	Guru Nanak	12.7	61.5*	25.8
12.	Jiwaji	100.0	0.0	0.0
13.	Jodhpur	100.0	0.0	0.0
14.	Kanpur	66.7	33.3*	0.0
15.	Karnatak	78.6	15.9	5.5
16.	Kashmir	90.4	0.0	9.6
17.	Kurukshetra	100.0	0.0	0.0
18.	Madurai	99.3	0.0	0.7
19.	Mithila	99.0	0.0	1.0
20.	Mysore	73.4	0.0	26.6
21.	Nagpur	100.0	0.0	0.0
22.	Panjab	24.4	74.7	0.9
23.	Poona	56.8	2.1	41.1
24.	Punjabi	87.1	0.0	12.8
25.	Rajasthan	33.6	66.4*	0.0
26.	Ranchi	98.4	0.0	1.6
27.	Sardar Patel	92.3	0.0	7.7
28.	Saugar	100.0	0.0	0.0
29.	Saurashtra	100.0	0.0	0.0
30.	Shivaji	100.0	0.0	0.0
31.	South Gujarat	92.2	0.0	7.8
32.	Sri Venkateswara	33.6	26.0	40.4
33.	Udaipur	100.0	0.0	0.0
34.	Visva-Bharati	..	..	..
	Overall	66.6	28.3	5.1

Note: *Percentage of mass copying cases.
.. No unfair means cases have been reported.

The excessive use of materials for copying by majority of students who planned to do it makes the things really easier for the university examination offices. It may appear platitudinous but all that is required to control the incidence of unfair means during examinations is to tighten the vigilance during their conduct so as not to allow students to use notes. A simple physical check of all students at the time of their admission to the examination hall, even if it appears repugnant to human dignity at first sight, will do the trick.

Mass copying in which students indulge in groups in an organized manner, although second in importance, does not seem to be as serious a problem as is sometimes thought of. Only 4 universities have reported cases

of mass copying involving just 10 centres of examination. In order to control even this much incidence of mass copying it may be a dministratively expedient to stop the entry of persons other than students and teachers connected with examinations at some distance from the examination hall. The establishment of flying squads with their element of surprise and suddenness may also prove detrrrent for mass copying.

Prohibiting the entry of unauthorised persons near the examination hall and empowering the invigilation staff to carry out physical search of students for hidden materials may not however be possible within the present constitutional framework of the universities. It may require a modification of university statutes or even the passing of certain laws by the State or Central legislatures declaring certain offences connected with examinations as cognisable offences.

Violence during examinations

Is violence during examinations a myth or reality ? Table 15.6 based on the data concerning the number of cases involving violence accompanying

TABLE 15.6

NUMBER OF UNFAIR MEANS CASES INVOLVING VIOLENCE DURING UNDERGRADUATE EXAMINATIONS (1972—73)

Sl.No.	*University*	*No. of Violent cases*
1.	Agra	*
2.	Allahabad	4
3.	Andhra	1
4.	Dibrugarh	1
5.	Guru Nanak	2
6.	Jiwaji	3
7.	Karnatak	1
8.	Kashmir	1
9.	Mithila	6
10.	Panjab	**
11.	Punjabi	6
12.	Saurashtra	2
13.	Sri Venkateswara	1
14.	Others***	0

*Total number of cases not given but some students were reported to have attacked the flying squad outside the college premises at one of the centres.

**Total number not given but some violence was reportedly used at one or two centres of examination.

***Universities of: B. H. U., Bangalore, Baroda, Berhampur, Bhopal, Gauhati, Jodhpur, Kanpur, Kurukshetra, Madurai, Mysore, Nagpur, Poona, Rajasthan, Ranchi, Sardar Patel, Saugar, Shivaji, South Gujarat, Udaipur and Visva-Bharati did not report any violent cases.

the use of unfair means during 1972-73 examinations may give some partial reply to it. Out of 34 universities responding to the survey only 13 universities have reported some violent cases. Maximum number of violent cases reported by any university is 6. The total comes to 28 which excludes two universities that have not reported the number of violent cases, although some violence was used. This is from a total of 16,635 alleged unfair means cases, in an examinee population of 16,48,248.

But whatever the magnitude, violence has no place in any field of life, much less in examinations. It tends to demoralize teachers and to reduce the efficiency of the examination system. The whole issue is to decide the dividing line between the tolerable and intolerable limits. *The present study, however, shows that in matters of violence in examinations there is no cause for alarm, although there is no room for complacency either.* Violent cases are likely to create a sensation and even a few cases may be damaging to the university system. Accordingly, universities should take stringent measures to prevent violence during examinations—even if it occurs in a small measure. All persons connected with the examination work should be declared as public servants and intimidation, assault or use of criminal force on them should be declared as a cognizable offence. It may be worthwhile to repeat here the recommendation of the Committee on Examinations (NCERT, 1971) that "the risk from assault to invigilators, examiners and others connected with public examinations should be covered by insurance. If it is necessary to introduce legislation for a proper risk insurance schemes for them such legislation should be introduced urgently. With the nationalization of insurance there should be no difficulty in introducing risk insurance scheme."

IV. UNFAIR MEANS AFTER THE EXAMINATION

The conduct of examinations brings the use of unfair means to a culmination but not to an end. After the examinations are over, there is every possibility that students may chase their answer scripts and approach examiners with a view to getting their marks enhanced. They may attempt even a classification of records in the examination office with the connivance of university staff or resort to some other methods. Table 15.7 gives the picture of unfair means after the actual conduct of examinations as revealed by the data received from 34 universities. Only 7 of them have reported some cases of unfair means after the examination. The maximum number of cases is 101 in Gauhati University. In the remaining universities, the number of cases does not exceed 5. Rajasthan university has not given the number of cases but has reported that there were a few cases in which students made appeals to the examiners. In one case a ten Rupee currency note was attached to the answer-book.

TABLE 15.7

NUMBER OF CASES OF UNFAIR MEANS AFTER THE EXAMINATION REPORTED IN THE UNDERGRADUATE EXAMINATIONS HELD DURING 1972-73

Sl.No.	*University*	*Total No. of cases*
1	2	3
1.	Baroda	4
2.	Gauhati	101
3.	Kanpur	5
4.	Karnatak	3
5.	Panjab	2
6.	Punjabi	4
7.	Rajasthan	*
8.	Others**	0

*Number not specified.

**The Universities of Agra, Allahabad, Andhra, B.H.U., Bangalore, Berhampur, Bhopal, Dibrugarh, Guru Nanak, Jiwaji, Jodhpur, Kashmir, Kurukshetra, Madurai, Mithila, Mysore, Nagpur, Poona, Ranchi, Sardar Patel, Saugar, Saurashtra, Shivaji, South Gujarat, Sri Venkateswara, Udaipur and Visva-Bharati did not report any unfair means cases after the examination.

Unless under-reportage is assumed to be on a large scale, it appears that the problem of unfair means after the examinations is not very serious. The incidence of students approaching the examiners can be easily eliminated almost completely by spot evaluation where the examiners move to the answer scripts at one or more centres instead of scripts moving to them. This has already been successfully tried out in some universities (e. g. Berhampur and Meerut). Spot evaluation is efficient in more ways than the mere controlling of unfair means by not disclosing which copies will be marked by whom. Besides being more speedy it can help to some extent in controlling the subjectivity of scoring. But more than anything else, the administrative machinery—particularly the confidential wing of the examination office—will have to be geared up for the broadened social base of university entrants and other social and moral realities.

V. PROCEDURE AND MACHINERY FOR HANDLING UNFAIR MEANS CASES

Procedures for preventing the use of unfair means, reporting them when they occur and processing them after they are reported are sometimes laid down in the university ordinances very elaborately. For example, in some universities, it is clearly laid down in the ordinance that the Superintendent should read out a warning to the students to the effect thay they do not possess anything on their person which could be of any help to them in the examination. It is also stipulated that this warning should be read out in the presence of other invigilators and the report be sent to the university.

If inspite of this warning the student is found to possess objectionable materials or indulges in other unfair means, the universities tackle the problem in a variety of ways. In some universities (e. g. Andhra, Gauhati, Mysore, Saugar, Sri Venkateswara) the Superintendents are empowered outright to expel the student from the examination hall. In some other universities (e.g. Bhopal, Dibrugarh, Jodhpur, Kashmir, Nagpur and Udaipur) the student can be expelled only in case of insolent behaviour, grave misconduct or threat to peace. But the most common mode of handling the situation appears to be the one in which student's answer book is sealed and sent to the Registrar/ Controller of Examination along with his statement, material found on him and the statement of the invigilator who apprehended him. If the student refuses to give his statement he is not forced but the fact is recorded in the relevant proforma. The student is generally given another answer book and is allowed to continue his examination.

Machinery for dealing with malpractices

The cases of alleged unfair means reported by different examination centres are dealt with by a machinery which varies from university to university. But, by and large, most of the universities (e. g. Andhra, Bangalore, Bhopal, Berhampur, Bhopal, Baroda, Dibrugarh, Gauhati, Jodhpur, Karnatak, Madurai, Mysore, Nagpur, Rajasthan, Sardar Patel, Saurashtra, Shivaji, Sri Venkateswara, South Gujarat and Udaipur) have a Committee appointed by the Syndicate with the final authority for prescribing punishment vesting with the Syndicate itself. Only in some universities e. g. Guru Nanak, Jiwaji, Kanpur, Kashmir and Saugar) there are autonomous bodies laid down in the university's statutes with full powers for awarding punishment. In Agra University the Executive Council has been delegating their powers to the Vice-Chancellor for the last several years and the Vice-Chancellor appoints a Committee to deal with the cases of unfair means. In B. H. U. also the Vice-Chancellor takes the decision on the recommendations of the Registrar. In Kashmir and Panjab universities there is a Committee of the syndicate for handling unfair means cases and the decision of the Committee is final. In Allahabad University, the Results Committee along with Pro-Vice-Chancellor as Chairman takes decisions regarding unfair means and the decision is put up to the Executive Council for final approval.

Opportunity given to the students

Whatever the machinery for handling unfair means cases the student is generally given an opportunity to explain his case. Only in B. H. U. the student is not given any opportunity except the statement taken on the spot. In some universities (e. g. Allahabad, Bhopal, Kanpur, Kashmir, Mithila, Saugar, Ranchi, Sri Venkateswara, South Gujarat and Visva-Bharati) the student can only file a written statement. In most of the universities (e.g. Agra

Andhra, Bangalore, Baroda, Berhampur, Dibrugarh, Gauhati, Guru Nanak, Jiwaji, Jodhpur, Karnatak, Kurukshetra, Madurai, Nagpur, Panjab, Poona, Punjabi, Rajasthan, Sardar Patel, Saurashtra, Shivaji and Udaipur) in addition to the written statement the student can seek personal hearing as well.

Norms of punishment

There is a considerable variation in the norms of punishment for various types of unfair means. Different universities, for example, take different view of the possession of material. The punishment for possession of material varies from cancellation of paper (e. g. B. H. U., Bhopal and Guru Nanak) to cancellation of examination (e. g. Berhampur, Gauhati, Kanpur, Rajasthan, Sri Venkateswara and Udaipur) and even to cancellation of examination and further disqualification for one or more chances (e. g. Allahabad, Andhra, Baroda, Dibrugarh, Jiwaji, Karnatak, Madurai, Mithila, Mysore, Nagpur, Panjab, Poona, Panjabi, Ranchi and South Gujarat). Similarly, in case of actual copying the punishment varies from the cancellation of the examination (e. g. B. H. U.) to the cancellation of the examination and further department for one year or two chances e. g. Allahabad, Baroda, Berhampur, Dibrugarh, Guru Nanak, Gauhati, Jiwaji, Kanpur, Mysore, Punjabi, Rajasthan and Udaipur) and even to cancellation of examination and a further department for two years (e. g. Andhra, Karnatak, Madurai, Mithila, Ranchi, South Gujarat and Sri Venkateswara). In case of violence accompanying the use of unfair means the penality is generally disqualification for two to five years. It may also become a police case.

In an atmosphere vitiated by malpractices, universities will have to evolve some common norms of punishment which may act as deterrents. For instance, possession of material which is by far the most frequent type of unfair means should call forth more stringent punishment. Some universities take rather a lenient view if the material is not directly helpful to the students. This attitude will have to be changed. What is important in this context is that the student came to the examination hall with the intention of copying. It is a planned non-simple type of unfair means. As suggested elsewhere a physical search of the students would help in checking the taking of objectionable materials to the examination hall but it would be preferable to have in addition to it, a deterrent punishment for possession of such materials. It may also be desirable for the universities to have some common norms of punishment.

Right to appeal

The mode and freedom to appeal against the punishment also varies from university to university. In some universities (e. g. Allahabad, B. H. U., Baroda, Jodhpur, Rajasthan, Sardar Patel, Saurasthra and Sri Venkateswara) the student has no right to appeal against the punishment. In some universities (e. g. Andhra and Gauhati) the appeal can be preferred to the same body

as has taken the decision while in some others (e. g. Kanpur and Kurukshetra) the appeal can be preferred to a superior body. In a few universities (e.g. Karnatak, Panjab and Ranchi) the students can appeal to the Vice-Chancellor while in some others (e. g. Berhampur and Mithila) the student can appeal only to the Chancellor of the University. Of course, in all cases the student can go to a court of law.

Proportion of cases punished

The percentage of the reported cases that were actually awarded some punishment for having used unfair means is given in Table 15.8. It varies from 51.6 to 100. The percentage is more on the high side being 100% in 11 universities (excluding B. H. U., Madurai and Visva-Bharati). The overall percentage of cases of unfair means that were awarded punishment comes to 74.3.

TABLE 15.8

PERCENTAGE OF ALLEGED UNFAIR MEANS THAT WERE ACTUALLY AWARDED PUNISHMENT

Sl.No.	*University*	*Percentage*
	1	2
1.	Agra	94.5
2.	Allahabad	100.0
3.	Andhra	63.9
4.	B.H.U.	N.A.
5.	Bangalore	97.2
6.	Baroda, M.S.	100.0
7.	Berhampur	94.1
8.	Bhopal	100.0*
9.	Dibrugarh	100.0
10.	Gauhati	100.0
11.	Guru Nanak	91.5*
12.	Jiwaji	98.9
13.	Jodhpur	96.8
14.	Kanpur	88.1
15.	Karnatak	51.6
16.	Kashmir	58.6
17.	Kurukshetra	83.7
18.	Madurai	N.A.
19.	Mithila	100.0
20.	Mysore	73.4
21.	Nagpur	96.6
22.	Panjab	62.1
23.	Poona	83.8
24.	Punjabi	74.1
25.	Rajasthan	98.0*

—	1	2
26.	Ranchi	100.0
27.	Sardar Patel	100.0
28.	Saugar	100.0
29.	Saurashtra	94.2
30.	Shivaji	100.0
31.	South Gujarat	82.4
32.	Sri Venkateswara	91.2
33.	Udaipur	100.0
34.	Visva-Bharati	...
	Overall	74.3

*Mass copying cases are not included.
...No unfair means cases were reported.

Court cases

When a student feels that the ends of natural justice have not been met in his case or when he does not have any avenues of appeal to the university authorities or has exhausted all of them he takes recourse to a court of law. The fact that there are not many court cases is amply proved by Table 15.9. There were only 54 court cases in all spread over 11 universities, 23 reporting universities having no court cases. It may be observed that the maximum number of court cases occur in a university which provides no right of appeal to the students.

TABLE 15.9

NUMBER OF CASES OF UNFAIR MEANS IN UNDER GRADUATE EXAMINATIONS WHICH WENT TO THE COURTS IN 1972-73

Sl.No.	*University*	*No. of court cases*
	1	2
1.	Agra	3
2.	Allhabad	8
3.	Guru Nanak	10
4.	Jiwaji	2
5.	Kanpur	2
6.	Mysore	2
7.	Nagpur	1
8.	Panjab	5
9.	Poona	1
10.	Punjabi	5
11.	Suarashtra	15
	Total	54

Note: The Universities of Andhra, B.H.U., Bangalore, Baroda, Berhampur, Bhopal, Dibrugarh, Gauhati, Jodhpur, Karnatak, Kashmir, Kurukshetra, Madurai, Mithila, Rajasthan, Ranchi, Sardar Patel, Saugar, Shivaji, South Gujarat, Sri Venkateswara, Udaipur and Visva-Bharati did not have any court cases during 1972-73.

VI. AETIOLOGY

It would be naive to establish cause and effect relationship on the data obtained through the present survey. In any case this is a problem that needs to be a researched upon further. At this stage, however, we can only conjecture some of the causes for the malpractices in examinations for the completeness of the paper, if not for anything else.

Obviously there cannot be a single cause for malpractices in university examinations. Cheating in examinations is essentially the illegitimate child of the educational system and the under-developed economy born in a decadent society. Thus, although the real culprits are the present system of university education including the examination system and stagnation in our economy, the part played by deterioration in moral and ethical standards of the people cannot, in any way, be overlooked.

Much of the cheatings in university examinations can perhaps be attributed to the milieu prevailing in the country. Is it not a fact that as a nation we have tended to become progressively less disciplined for the last few years ? University campuses, being an epitome of the society at large, are bound to reflect both its yearnings and weaknesses. Accordingly, we should naturally expect waves of unfair means in examinations rising or falling with the general atmosphere of corruption in the country. If the society at large passes through a pathological state of affairs, the adolescents, prone as they are to easy influence, cannot escape the unhealthy influence of the diseased society. For example, if a youngman's next door neighbour becomes rich over-night without much of effort, the young man is bound to reassess his value system. When he sees corruption and bigger crimes being perpetrated with impunity, unfair means in examinations pale into insignificance for him. Thus we may look upon unfair means in examinations as really only an aspect of the general lack of discipline in our society.

Malpractices in examinations may also be partly due to social and cultural transformation taking place in our country. Old social institutions like the joint family are disappearing, with the consequent loss of social moorings. From a tradition-bound agricultural society we are trying to transform ourselves into an industrial society with its materialistic values. Our value system is being gradually eroded. It is an era of transition from a past which we have abandoned to a future which we are, as yet, unable to comprehend. Coupled with this transitory stage, with its deficient social checks and decimated values, is the revolution of rising expectations in the post-independence period. As a result of these expectations the traditional values of content with what one has, is being replaced by an impatient expectations of affluence even at the cost of ethics. This social ferment and the failure of our economic and educational systems to respond to it is a possible cause of the unfair means in university examinations.

The real partner, however, remains the poor state of our economy which has eventually failed to keep pace with the rising expectations. Are not these unfair means relatively less common in developed countries even when their cultures are in a more decaying condition and when they are looking to us for guidance in matters spiritual ? If industrial development is commensurate with educational expansion with a guarantee for job or decent living for every one passing out from the universities there would perhaps be no corruption in university examinations. Unfortunately, this has not happened in India where even engineering graduates sometimes remain unemployed. This gap between industrial development and educational expansion causing too many graduates following too few jobs is perhaps the greatest cause for unfair means. The situation becomes worse when in the rat race for jobs, university degree becomes the main criterion.

The social and economic maladies mentioned above should not, however, become an easy alibi for academic suphoria. All is not well with our educational system either. Academic should peep into their cupboards for possible skeletons. As is clear from the present study, we cannot even pass the bulk to administrators in the form of an enormous expansion in university education as no relationship has been discovered between the unfair means index in the universities and the number of students they are required to handle. The broadened social base of university enrolment may be partly responsible. The student population in the university is no longer an elitist group. Now we find students from all strata of society in the universities. With university degree as an easy instrument for social mobility it is not surprising that there should be an increase in the incidence of unfair means in the universities.

Complete lack of scientific admission procedures may also be partly looked upon as an educational cause of unfair means. Universities are virtually following open door policy with hardly any tests worth the name except in professional faculties where the incidence has been discovered to be significantly less than that in other faculties. Students without any aptitude for higher learning find places in the universities and become not only a potential source of indiscipline during their stay in the universities but also resort to unfair means during the examinations. Even when they have not really profited from university education they want to get degrees by all means—fair or foul.

Among the causes directly related to the examination system, the strongest appears to be the fact that examinations in our country, more than in any other country, have become a linking mechanism between the universities on the one hand and socio-economic institutions on the other, so much so that the future of a person very much depends on his examination results. But the worst part is that the judgement passed by examinations is, by and large, irreversible with the effect that once a third divisioner is always a third divisioner. Are our examinations really so infallible as to award permanent labels to human beings ? It appears that the reliance laid upon examinations is rather incommensurate with their level of accuracy. Either the accuracy

and efficiency of examinations has to be increased or the reliance placed on them has to be drastically cut.

The way examination results are reported and used also has a bearing on the incidence of malpractices. We are pretending to be too precise in examinations with every single mark counting for achievement. We are using generally 101 point scale with the implicit meaning that a student getting 50 marks is superior to one getting 49. It is, by all means, a very retrograde method of grading. Academics in some other countries have started revolting against even the five points scale. With the error of measurement, which may be considerable, the type of marking in our examinations cannot be justified. Instead of in any way increasing measurement value of examinations, this type of marking encourages students to resort to unfair means to get a few marks because every mark ultimately matters. The Education Commission's (1964-66) recommendation of providing grades in addition to raw scores is worth a serious consideration by the universities.

There is another aspect of our examination system which contributes to the use of unfair means. The trouble with university examination is that we ask them to do rather too much. We expect them to discriminate between candidates, to provide evidence of standards, to act as guides to good teaching and to provide incentives for both students and teachers. We expect them to predict future performance as well as to certify that a candidate has completed satisfactorily a course of recognized study. Add to these the social and economic purpose they serve. Since so much depends upon examination marks which are generally the result of a single examination at the end of the course, students are naturally tempted to enhance their marks. An important hypothesis, which can be verified further, is that if the omnibus type of test is replaced by specific purpose tests by the employers or institutions for higher education the temptation to cheat in the university examinations would be sizably reduced and even malpractices in those specific purpose tests would be much less because of other alternatives available to the students.

VII. CONCLUSION

In sum, it may be reiterated that the problem of unfair means in university examinations is very much real. Moreover, it is as universal as it is complicated. Although it has a socio-economic aspect, the educators cannot absolve themselves completely of their responsibility in the matter. In fact short term measures would have to be only educational and administrative in nature and this falls entirely under the purview of the universities.

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Semester System and Internal Assessment in Meerut University

J. N. KAPUR

I. SOME IMPORTANT FEATURES

Meerut University holds three examinations in a year, usually in the last weeks of November, April and June.

The two normal semesters have about 90-95 working days each excluding the period of examinations and the summer session is of about six week's duration. It was envisaged that colleges will be able to hold regular classes during the summer session whereby students could even earn advance credits and the university could realise the possibility of working round the year. In practice, it has not been found possible to hold these classes.

All courses are framed on semester basis, except practicals in which examinations are still conducted only once a year in April. An exception is, however, made in the case of some practical examinations in the agriculture faculty where examinations are held semester-wise. A special project of combining internal and external assessment and semester-wise practical examinations is also being tried under the University Leadership Project in Botany. There is also some demand from other students for practical examinations every semester, but the university has not been able to accept it for administrative reasons.

Paper setting is done by professors and readers of other universities and valuation is done by the teachers of the university. An exception is made when the number of answerbooks in a paper is small or where a paper is taught in one or two colleges only. In these cases, valuation is done by outside examiners only.

For valuation purposes, teachers come to the valuation centres and, on each day, each teacher gets for valuation about 30 answer-books for post-graduate courses or about 40 answer-books for undergraduate courses. No answerbooks are sent to the homes of the examiners. For each course there may be 5-6 examiners and a Deputy Head Examiner and they can discuss the instructions for valuation among themselves. In the case of M.A. papers, usually different questions are examined by different examiners. Last year

examiners were, however, allowed to get their allotted quota of answer books from the valuation centres and examine them at the centres or at their homes. This was done to meet the request of some teachers who felt they could concentrate more at their homes than at the centres. This was subject to the condition that an examiner could get his next day's quota only when he returned his previous day's answerbooks after marking them.

Tabulation and collation are done by a computer and students get their marks-sheets as prepared by the computer. Award sheets are prepared by the computer and are not printed. All available pre-examination data are supplied to the computer and are stored in its memory. These data include marks obtained by each student in his earlier examinations.

Since valuation is finished within a forthight of the examination, two copies of the marks obtained by students in each paper are sent to each college direct from the valuation centre and students know their marks much earlier than they do in the traditional system.

There is a provision for revaluation, so that a student who wants to get his answer book revalued can do so on payment of a certain fee. His answer books are sent to two independent examiners from outside the university and the average of the marks given by the three examiners is awarded to him. If this differs by more than 15% from the marks given by the original examiner, the revaluation fee is refunded to the student. Two other systems of finding the revaluation marks have been tried viz the average of the nearer two of the three marks or just the average of the marks given by the two new examiners. Moreover, if more than 50% of the students who appear in a paper feel that the marking has been unfair and apply for 'mass revaluation', a reduced fee is charged.

A student is required to secure 20% marks in each semester course and 33% marks in aggregate of the four semester courses in a subject in B.A./B.Sc. and 36% of the aggregate of 8 semester courses in the case of M.A./M.Sc. If a student gets less than 20% marks in a course (theory or practical), he has to appear again in that course either in summer or when the examination in that course is held again in the university. In LL.B. the student has to obtain 36% in each course and a minimum of 48% in the aggregate.

There is a provision that if a student gets more than 20% marks in a course, but his marks are not up to his expectation, he can cancel the paper and reappear. The university withdrew this facility three years ago, but had to reintroduce it on an agitation by the students.

In principle, a student can join the second semester for those courses which are not dependent on the papers taught in the first semester and where practicals are not involved. The university withdrew this facility last year but postponed its implementation for a year as the students were not informed about it in time.

A degree student can get an honours degree by appearing in certain additional courses either during the regular term or during the summer.

General courses with about 12% weightage of the main course have been introduced with the objective of introducing inter-disciplinary courses. 'Religion and Culture' is one of the compulsory general courses.

In principle, a student can earn advance credits by registering for courses in summer, even before the result of his qualifying examination is out.

The student is expected to earn the degree in three years time and he has to apply for special permission of the Vice-Chancellor if he has to take it in the fourth year. In principle, some students can complete their courses in 1½ years by using their summer time, but in practice, no student has taken advantage of this provision so far since the university has not allowed its use in order to get its degrees recognised by other universities for equivalence purposes and also because it has not been possible to make effective provision of summer courses.

75% attendance is required in each course in each semester, though in practice, due to exemptions granted by the principals and the Vice-Chancellor, it comes to be only 60%. There are however frequent complaints that in quite a number of cases, the university gets a 60% attendance certificate even when the student has a smaller percentage of attendance.

Computer is used to tabulate results in order to save time and for achieving possibly greater efficiency, accuracy and reliability, but mainly due to the complexity of the semester system.

Table 16.1 gives the schedule for admissions, teaching and examinations at Meerut.

TABLE 16.1

SCHEDULE FOR DIFFERENT SEMESTERS AT MEERUT

	I and III Semester	*II and IV Semester*	*Summer*
Teaching to begin on	8th July	18th Dec.	15th May
Admission to close on	7th July	19th Dec.	15th May
Closing day of Semester	12th Nov.	15th April	30th June
Examination to commence on	19th Nov.	22nd April	1st July
Semester break from	5th Dec. to 19th Dec.	7th May to 6th July	30th June to 6th July

During the last year, however, the schedule was disturbed due to various reasons.

A student can re-appear in one additional course in a semester though he can be permitted to re-appear in two additional courses, if he saves a year by this process.

Award lists are prepared by examiners in quadruplicate of which two are sent to the colleges and two to the university office by the controller of the valuation centre. The system of 'mark-sensing' was tried for a year. In this system the examiners filled in the marks on cards with a special pen and these cards could be fed directly into the computer, reducing chances of error significantly and saving a great deal of time. However the system was given up as examiners made more mistakes in filling in the cards than the computer punchers did in punching the cards for the computer.

II ADVANTAGES OF THE SYSTEM

The students become more serious and there is more regular study throughout the year. A student joins in July and has to appear in the examination in November. He has to become serious about his studies in the middle of August itself. In the earlier system, he used to become serious in January or February. In fact he becomes conscious of the examination quite early as he has to fill in the examination form within a fortnight of the start of the semester.

Most of the students study very seriously and intensively for two months in a year as compared to the intensive study for one month in the earlier system. In addition some students study for a third month in the summer session.

The wastage of the time of the students is reduced. About 60% of the students are able to complete the degree requirements in 2½ years and more than 90% complete in about 3 years time. This is achieved without lowering the standards. In fact, in this system, a student has to obtain not only 33% marks in the aggregate, but also 20% in each paper of a subject.

External paper setting sets the standards, while internal valuation enables the examiners to moderate the results to some extent. In fact, whenever a paper contains out-of-course questions, a meeting of concerned teachers and deans is called immediately and a decision is taken on the amount of moderation needed. The decision can be implemented effectively since all examiners are internal. This arrangement has acted as a safety valve' for the genuine grievances of the students against not-too-careful paper setters.

The colleges have more or less the same number of students in each semester and it has had a healthy influence on the finances of the colleges, though ultimately the benefit goes to the government because it gives correspondingly smaller grants to colleges.

In this system, the teachers also get more money from valuation work, as almost the whole of valuation work is done by them. Almost ninety percent of the teachers are involved in examining answer books and get valuable information from this process which can help them in improving their teaching. In universities with the normal valuation system, sometimes sixty percent

teachers do no valuation work and are thus deprived of both valuable experience and money.

Since the answer books are examined at the valuation centres, there are no complaints of approaches to the examiners by the candidates. Even when teachers take answer books to their homes, these do not remain with them for more than twenty-four hours and students do not know which answer books a teacher is going to get.

This system enables the teachers to meet at common centres 2 to 3 times in a year and make them feel that they belong to a common university, since otherwise contacts between teachers of the same subject of an affiliating university are not always common. These frequent contacts have enabled the university to organise many successful subject conference at the research level in the evenings during 'spot evaluation'.

Teachers do valuation work for 5-6 hours a day in the morning and can spend 2-3 hours in academic discussions on topics chosen in advance. This encourages developments of an academic atmosphere in the university.

There is more uniformity in marking here and the valuation is on the whole fair as the university sees that only those teachers who are teaching the subject at present are called upon to mark the answer books. This cannot always be ensured in the system where some of the examiners from outside the university are chosen on the basis of their seniority rather than on the basis of their teaching a particular paper in the current year. This also prevents valuation of answer books by persons other than teachers. When answer books are sent to the homes, there is no means to ensure that less qualified persons may not be examining the scripts.

The fairness of marking is justified by the analysis of the results of revaluation. Generally marks in about 20% of the answer books remain unchanged; in about 40% cases they are increased by 1 to 5%; in 35% cases they are decreased by 1 to 5%; and, it is only in 5% cases that marks are changed by more than 15%. The small departures can be explained by randomness and subjectivity. In the other system, there is no careful analysis of the standards of marking adopted by different examiners.

This system enables the colleges to prepare a larger number of students, since wastage is reduced. In the earlier system, failed students occupied many of the available seats and therefore chances for admissions to new students were reduced. In our country, with limited resources, we have to make the best use of the summers by giving advanced credit courses.

Semester system is more convenient for those who appear through correspondence courses or as private candidates, because in this system, they have to appear at regular intervals, Even regular students prefer to appear twice a year so that their memory is not strained to the same extent as in the annual examination system.

The concept of "failure" has been eliminated from the system and this has had a psychologically healthy influence on the minds of the students. Of

course, some persons are very much worried by the fact that a student never "fails" in this system.

There is a greater variety of courses being offered and there is greater flexibility in the system than is normally possible in the universities. A greater number of teachers participate in post-graduate and advanced level teaching than was possible earlier.

There has been some encouragement to the introduction of the inter-disciplinary courses. Advantage has also been taken of the introduction of the system for rationalising and modernising the curricula.

Although sufficient data are not available, students are reported to be making greater use of the library than they used to do previously.

III. DISADVANTAGES OF THE SYSTEM

It increases pressure of work on the colleges and university offices. They have to work round the year for holding examinations and declaring results of candidates.

Since the system is new, everybody takes some time to get adjusted to the system and this causes difficulties in the first one or two years. Even otherwise the system is so complicated that even experienced persons can make mistakes.

The combination of almost perfect computer system and not-so-perfect human system leads to difficulties in working with the computers. A mistake made by the superintendent or an examiner can be corrected by the human tabulator, but the computer will not automatically correct it, though it will detect the error much more efficiently.

Sometimes, the examiners at valuation centres make errors in transferring marks from the answer-books to the award sheets or they enter the marks against the wrong roll number or they show somebody as absent when he is present. These award sheets are sent to colleges and to the computer centre. The computer and the office detect some of the errors and these are corrected. However, the student finds discrepancies in the marks as shown by the computer and is naturally worried about this.

The office has to coordinate the results of 4, 5 or 6 examinations in which the students may appear before he gets a degree and this leads to problems at times. In practice, there has to be further coordinations between the marks sent to the colleges and marks as finally corrected and prepared by the computer. Sometimes it means coordination between twelve sets of marks.

Though by central valuation uniformity of standards in marking is obtained, the atmosphere at valuation centres may not be conducive to concentration by an examiner as he has to share the room with 4-5 colleagues.

A student after finishing a semester course, cannot afford to revise it, whereas in the system of annual examinations, he may revise some of the earlier courses more often. In other words, the overall knowledge of a student

in a subject is tested to a smaller degree in the semester system than in the other system. To remedy this, it has been suggested to introduce oral examinations at least at the post-graduate stage. Difficulties have, however, arisen because of the already complicated nature of the system adopted.

Since in this system nobody fails, it is possible that some students who have not attained a certain standard may reach the next semester class. That is why 20% minimum pass marks in every course are being insisted upon. Again, because of vested interests the efforts of the university to impose certain minimum standards before a student can go to the next class have not met with success.

It is essential for the success of the system that the number of holidays should be reduced to the minimum and the working days be increased. In view of various unexpected holidays and lack of seriousness, the number of working days in many cases goes down to 80 or even to 70. Fortunately there have been no student disturbances in the university, since otherwise these will be more harmful to the semester system than to the annual examination system. It is sometimes claimed that one of the objectives of the semester system is to keep the students busy and to reduce the chances of students organising strikes. It is true that one of the objectives is to keep the students busy, as this is a desirable academic objective, but the semester system has not been introduced, nor it should be introduced, just to reduce student unrest. For that, we will have to find out the root causes and remove them rather than introduce the semester system as a remedy.

It is alleged that the system has increased the use of made-easy books and the study of standard books has been reduced. Even if the facts are correct, it is not clear whether this is due to semester system or due to change of medium since standard books are not available in Hindi to the same extent to which they were available in English or whether it is due to lack of motivation on the part of students for excellence in education.

Because of lack of finances, full use cannot be made of the flexibility of the normal semester system. In particular, the total number of question papers cannot be changed significantly and so courses which are broken up for the purposes of teaching have to be recombined for purposes of examination.

IV. HOW THE MEERUT SYSTEM DIFFERS FROM OTHER SEMESTER SYSTEMS

There is no internal assessment. In fact, due to the affiliating nature of the university, an effort is made to see that a teacher does not examine his own students. There have been some cases where teachers are alleged to have given less marks to the students of other colleges. Sometimes teachers of one college have alleged unfairness of teachers of another college. In one case, the university had to order free mass revaluation of about 5000 answer books due to the widespread feeling of unfairness among students of some colleges.

There is no overall assessment of the student's work done throughout the semester and the result of the semester depends upon the papers he takes in the university examination. There is a mid-semester test in the colleges, but its marks are not counted and so it is not taken seriously by the students. In fact in most colleges, the test is not held at all.

There is no system of grades. The numerical marks determine the performance of the students.

Even in the case of practicals, where the teachers concerned are associated, there have been complaints of pressures on the examiners. Unlike IIT's and foreign universities where most of the students have no local influences, here almost all the students in a college have local influences and these influences are sometimes misused by the managements, teachers, parents and guardians. In the present system, these influences are not effective except to a very limited extent in the practicals.

In foreign universities, due to internal assessment, not much time is wasted on examinations and usually a week in each semester is enough for this work. Here because of the need for coordinating the standards in different colleges and external examination system, more time is needed for examinations. In fact, teachers are quite busy in this system in teaching in the semester time and in examining answerbooks during the semester breaks. The teachers feel strain, but at the same time they do want to supplement their incomes by the remuneration they get from valuation of the answerbooks.

There is no system of 'credits' and all main courses have the same number of contact hours. No account is taken of the hours required for home study in curriculum planning.

Though marginal flexibility has been built into the system, there is still a great deal of rigidity and students take the same fixed combination of courses. This is partly due to the rigidity in the system in neigbouring universities and partly due to the inertia in the thinking of the public and the employers. There are also the problems of lack of physical accommodation in the colleges and of lack of management capabilities needed for a flexible system.

V. SOME SUGGESTIONS FOR IMPROVEMENT

For the success of the semester system, holidays should be cut down drastically and a certain minimum of lectures in each subject should be insisted upon.

The office staff in a university using semester system should be increased by about 30% as compared to the university which is following the annual examination system. In colleges also, there should be corresponding increase in the office staff.

The increase in cost may be met either by the government or by a slight increase in the fees from the students. At Meerut University, there was no increase in fees and the university agreed to have too examinations and charge

the same fee as was done earlier for holding one examination. The increased cost is justified by the reduction in wastage of student's time.

Strict discipline is to be observed at valuation centres and one way of doing this will be to have more space at the disposal of the examiners.

Some internal assessment can also to be introduced in the system. Thus during each semester, there may be 2-3 one-hour tests for each course in the semester by the teacher in his own regular teaching periods. These should be marked by teachers and returned to students so that they can see that answer books of all the students have been marked with the same standard. Some of these tests may be based on library reading by the students so as to encourage use of the library in the colleges. These tests may carry up to 50% marks and the remaining 50% may be based on a paper set by an external examiner. This will lead to regular study throughout the semester.

Some system of moderation of internal and external marks will have to be developed so that the teachers may have no tendency either to be strict or lenient. A system of combining internal and external assessment marks may also be worked out.[1]

More objective-type questions will have to be introduced in question papers.

Oral examinations and project reports will have to be given greater importance.

Root causes of students' indiscipline will have to be removed with sympathy so that the studies during the semester are not disturbed by extraneous causes.

There should be only two types of courses, the main courses to be run for four semesters and half-courses to be run for two semesters. Some of these courses have to be job-oriented to meet the needs of the society.[2]

Summer courses have to be organised more systematically by a central agency and should not be left to the colleges. As the number of students in summer in each college may not be sufficiently large, a number of colleges should collaborate in running the summer courses.

For making advance credit system more efficient, sufficient publicity has to be given and the office has to be strengthened to keep record of advance credit.

VI. CONCLUDING REMARKS

What has been described as the semester system at Meerut University is a complex system, some features of which can be used even in the traditional

1. A method of combining internal and external assessment marks is given in author's 'Current issues in higher education in India'. New Delhi: S. Chand and Co., 1975.
2. A committee set up by the Meerut University has prepared a detailed scheme in this regard.

annual system of examinations. Thus central valuation, use of computers, revaluation, can fit into the annual examination system as well. It will, however, be difficult to reduce the wastage and increase the utilisation of summers in the annual system.

Meerut University has now about 80,000 students in 60 colleges and the conduct of three examinations in a year for these students and the coordination of results of these examinations has been a great strain on the university's resources. There have been frequent complaints of delays in the receipt of marks sheets and degree by the students. Though more than 99% of the students receive their degrees in time, yet delays in the case of 1% are intolerable. However, we have to remember that coordination of the results of 5-6 examinations for one student is more than three times as difficult as coordination of the results of the usual two annual examinations in the case of most of the universities. Considering this, the success of Meerut University, to the extent it has achieved it, appears remarkable. This has been made possible by the dedicated work of the office staff of the colleges and the university. This is, however, causing such a strain on the system that there is a fear that the system may break down unless immediate steps are taken to simplify the system and to increase the input of resources.

For simplifying the system one of the suggestions is that summer examination should be abolished. Since the examination is held before the results of all the papers of the second and fourth semester examinations can be declared, the students cannot fill the forms in time. The number of students appearing in the examination cannot be estimated. At one time there were 60 papers in which no candidates appeared and in an almost equal numbers of papers, less than 10 candidates appeared. The valuation of answer books in first and second weeks of July keep the teachers busy and delays the starting of classes in the colleges so that teaching work suffers. The results of summer examination cannot always be declared in time to be useful to students for admission to university classes. The existence of the summer examination makes some students less serious during the semesters as they always hope to make use of this examination to make up for any failures in the semester examinations. The college teachers also want sometime in summer to relax, and study and if they are busy in invigilation and valuation, they do not get this time. The summer examination has not also fulfilled its main purpose of encouraging summer courses since the colleges, busy as they are in connection with examinations, are not interested in starting summer courses and courses for advance credit for students. In view of all these factors it is desirable that summer examination should be abolished and the university should conduct only two examinations in a year. This should enable the university to give marks sheets and degrees in time.

We have also to remember that no other university in the world holds an examination in summer except for courses which are actually taught in the summer semester. Meerut University should also be prepared to give this

facility of summer courses and to encourage starting of regular courses in summer in those colleges which are prepared to give this facility to their students.

Nevertheless, the summer examination has one advantage for the students, namely, those students who fail to secure 20% marks in a semester Courses may clear this course in summer. The university should have a policy that all those who pass their courses in the first attempt should complete their degee requirements in two years while others who fail in one or more courses may take 2½ years to complete the requirements. A students who fails in a course in the first semester may take the examination in the course along with the third semester examination. Similarly, a student who fails in a course of the second semester may take the examination in it along with his fourth semester examination. A student who fails in a third semester course can take it along with the next third semester examination, thus completing his degree requirements in 2½ years. However, a student who fails in the fourth semester examination or who fails to make up the aggregate may require three years in all. To prevent this, the university can hold a one-day special examination just prior to the third semester examination in which every paper of the fourth semester for which students have registered can be held. This may be similar to the supplementary examinations of other universities. Students who register for this course may be provisionally allowed to take admission in the next class.

In fact the university abolished summer examination once, but it had to be re-introduced as twenty percent of the students benefit from it and consider it as one of their 'rights'. The students know that this examination may result in delay of marks sheets but they consider it as the lesser of the two evils.

A second suggestion for simplification of the system is that students should not be allowed to seek admission direct to the second semester. This permission is even now not given in courses which have practicals and in those subjects where first semester courses are pre-requisites for the second semester courses. In other subjects also there is a demand on academic grounds to stop this practice. For the present, the university can discourage such admissions and need not give any special facilities for such students.

The increase in input of resources can be by the following means:—

(a) Increase of fees of the students enabling the university to increase its staff to cope with the heavy work involved in connection with the semester examination.

(b) Additional financial grants to the university by the government. This will be justified since the semester system leads to the saving of time of the students and thus leads to addition to our national resources.

(c) The acquisition of a computer by the university. Today the university has to hire time on computers of private companies. If the university has a computer of its own, it will not have to depend upon outside agencies and this will considerably increase the efficiency of the semester system.

This report is still subjective and qualitative. Meerut University has enough records which, on being analysed statistically, can give a great deal of useful information. The university should get UGC assistance in carrying out such a quantitative survey.

The success of any system depends upon the persons who operate it. The students, the teachers, college managements and the office staff have all to cooperate in making any system a success. Whatever be the system, unless the students and the teachers have a desire for learning and are prepared to put in hard work, the system cannot succeed. There is no doubt that the semester system is more demanding of the teachers, students and the office staff than the annual system. If all the parties are interested in improving standards and are prepared to put in harder work, the system can surely be an improvement. On the other hand, if the students are not well-motivated, if the teachers consider every increase in work as a burden and if the office staff cannot give their wholehearted cooperation, the system can lead to more problems than it can solve. The essence of any educational system is the dedication and devotion of students and teachers. Examinations are just a means to provide motivation for regular study. In this sense, the semester system does provide motivation for more regular study than the traditional system.

The semester system at Meerut University succeeded because the students, teachers, parents, university officers were all satisfied with it for different reasons.

(a) The students were satisfied because they never failed; they took less time to get the degree and they had the facilities of cancellation, summer examination and revaluation.
(b) The teachers were satisfied because they were almost all involved in the evaluation work.
(c) The parents were satisfied because their children never failed.
(d) The university officers, after having started the system, had a stake in its success.

However, more recent developments may mean the weakening of the will of the four parties:

(a) The students want basic changes in the educational system. The semester system is not a basic change. Internal assessment may be a more basic change.
(b) With the new UGC scales, the motivation of the teachers for more examinations will go, as they may not need additional remuneration from this work.

(c) With the possible delinking of degrees with examination, parents may become interested in real education and not in just their wards not failing.

(d) The university authorities are already under too much strain because of the use of unfair means in examinations and the rapid increase in the number of students, making the systems almost unmanageable. Moreover the university authorities will like to divert some of their energy from conduct of examinations to development of the university.

TOWARDS INTERNAL ASSESSMENT

Beginning the academic year 1975-76, the university has launched on a bold new experiment of internal assessment. The first, third and fifth semester examinations are being conducted by the colleges and the second, fourth and sixth semester examination will be conducted by the university. The guidelines for the college examinations are given below:

(a) For each semester course, there will be three tests as under :

(i) Test I : It is of one hour duration and will be held in the first week of September. The maximum marks will be 20% of the total maximum marks assigned to the course. The teacher teaching the course will conduct the test in a regular period. The date of the test in consultation with the Head and the Principal will be announced by the teacher in the class at least three days in advance. Those who are absent for any reason will be awarded zero mark in the test. The answer scripts will be shown to the students in the class and these will be returned by the students to the teacher after going through the same in the same period and class. Care is to be taken that answer-book is given to the student concerned and taken back from him. The teacher will then deposit the answer-scripts in the college office. The answer-scripts will be kept in the college for a period of six months. The awards will be prepared in quadruplicate; three copies will be handed over to the Principal through the Head of the Department and the fourth copy will be retained by the teacher for further reference.

(ii) Test 2 : It will be held in the first week of October and will also be of one hour duration and will carry 20% of the total maximum marks assigned to the course.

(iii) Test 3: It will be of three hour duration and will be held in the last week of November. The maximum marks will be 60% of the total maximum marks assigned to the course. The Principal of the college will get the question-papers set by the teachers teaching the subject. The dates for the test will be announced by the

Principal of the college and the test will be conducted after making seating arrangements as in the university examinations. This will be a compulsory test and those who are absent in this test will be considered to have failed in this test and if their attendences are complete will appear next year in Test 3 held at the college concerned as ex-students. The answer-scripts will be collected immediately after the test and deposited in the college with the Principal. After the examinations are over, the teachers teaching the course will examine the answer-scripts in the college under the guidance of the Deputy Head/Head of the Departments as approved by the Principal and where there is one man Department, under the guidance of the Principal. The awards will again be prepared in quaduplicate. The answer-scripts will thereafter be handed back to the teachers concerned and he will show these to the students and will take these back for depositing the same in the college office where these will be retained for six months.

(b) Marks sheets to the candidates will be issued by the college under signature of the Principal.

(c) No direct admissions will be allowed in second and subsequent semesters.

The new scheme has been in opertion for some time. Thanks to the new discipline generated by the Emergency, the scheme has been fairly successful. It has been an incentive to harder and regular work by the students. Some teachers have also used innovative methods in testing. As expected, there have been complaints of upgrading of students by the teachers and of variation in marking from college to college. Some weaker colleges have given high marks to their students in inernal tests and the students of good colleges are sore about it. However the situation is very much under control.

The scheme is a step in the right direction. Its success will be watched with great interest. In the new atmosphere, the new scheme of examinations of combining internal and external assessment as proposed by the present author elsewhere (current issues in Higher Education in India, S. Chand & Co., Delhi 1975) can be successfully implemented and will provide the ideal solution for affiliating universities.

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